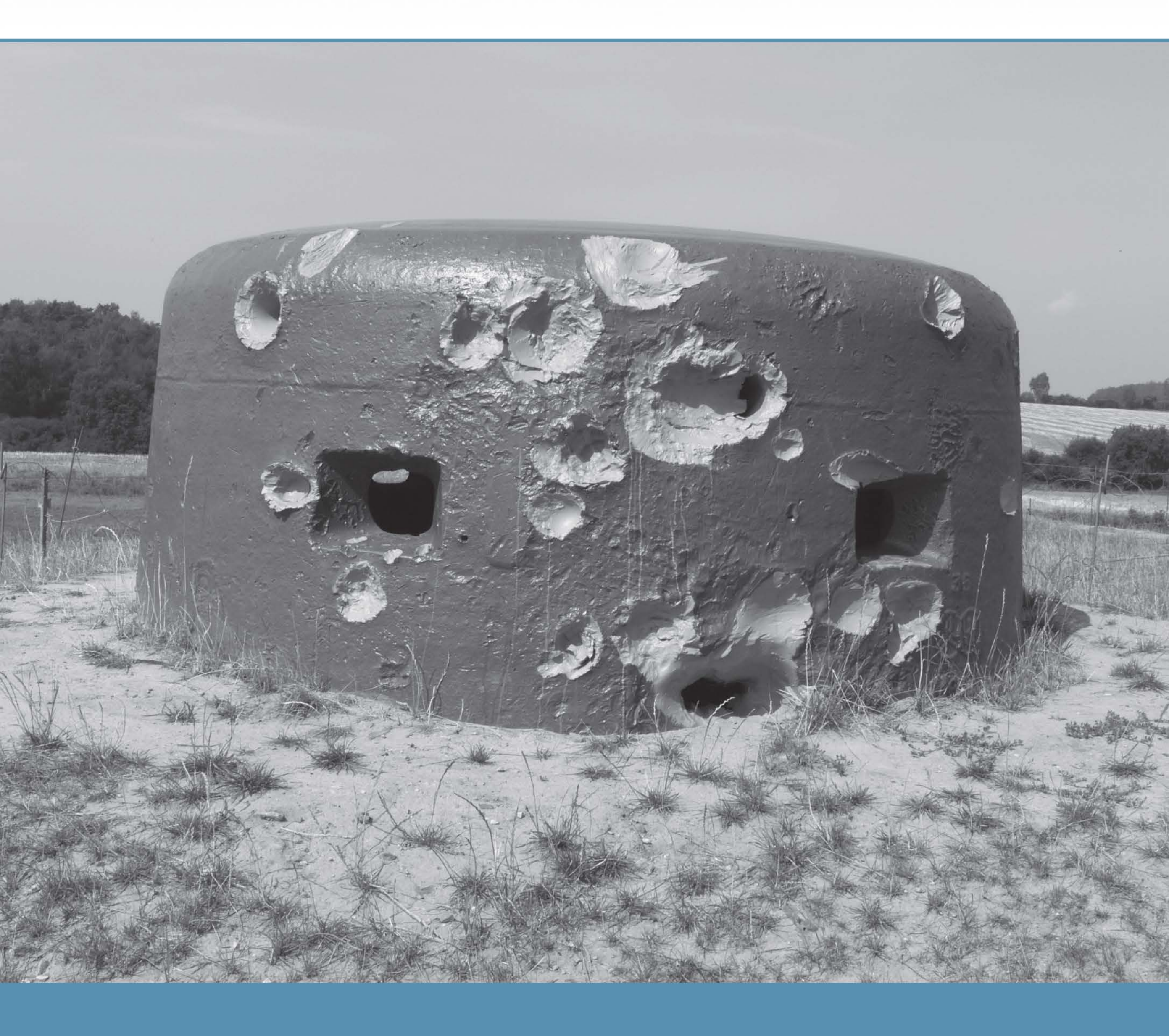
GERMANY'S EAST WALL IN WORLD WAR II



NEIL SHORT

ILLUSTRATED BY ADAM HOOK

FORTRESS 108

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SERIES EDITOR MARCUS COWPER

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INTRODUCTION

In the years since the end of World War II the focus of Western historians interested in German defences has concentrated on the Atlantic Wall and the West Wall, or Siegfried Line. This is not surprising for a number of reasons. Firstly, the defences are in Western Europe and are therefore relatively easy to visit. Secondly, the museums and archives holding the primary sources are open to the public, making research more straightforward. Finally, the exploits of the men involved in the bitter fighting to break through these defences are detailed in numerous books and on screen. The result has been the creation of a substantial body of work detailing every facet of Hitler's western defences. This cannot be said of German defences on the Eastern Front. These are rarely mentioned in popular culture, and with the dropping of the Iron Curtain after the war, little archival or archaeological research could be undertaken and as such, very little has been written in English on the subject. This book goes some way to redress the balance, though in truth it does little more than scratch the surface, primarily concentrating on Germany's eastern border defences. The defences of East Prussia are also included as are the defences built during the war in the former Soviet Union and Poland – the so called 'new East Wall' – but they are not covered in as much detail – not because they do not warrant mention, but simply because space does not allow.

Contrary to popular perception, Hitler's eastern defences were not the first constructed by the German peoples in that part of the world. The Teutonic Knights built great castles, and in the succeeding centuries these were modernised and extended creating great fortifications at strategically important points. In World War I these fortresses were still important, but increasingly trenches came to dominate the battlefield; as the war in the East descended into a bloody stalemate, these trenches were reinforced with concrete shelters. In 1918, following the Russian Revolution and subsequent peace agreement with Russia, these defences were abandoned. German forces were moved to the Western Front, but



Panzerwerk (Pz.W.) 775 – formerly Pz.W. 516 – near Hochwalde (Wysoka) which formed part of the Oder-Warthe-Bogen defences. To the left can be seen the armoured plate and loophole for a machine gun. Next to this is the main entrance and then to the right is the PaK Unterstellraum – shelter for anti tank gun.

they were unable to deliver the knockout blow against the Western Powers buoyed by the arrival of American troops, and soon Germany sued for peace.

After World War I Germany, which was seen as the aggressor by the victorious nations, was subject to a punitive peace agreement. Her armed forces were much reduced and her eastern borders were redrawn leaving a number of strategically important fortifications beyond its post-war borders. Those that remained in Germany could be maintained but not strengthened and her ability to build new defences was severely curtailed. Germany's vulnerability coincided with the re-establishment of a Polish state that had already shown its aggressive intent in the Russo-Polish War of 1919–21. Unsurprisingly then, the fledgling democracy, though constrained by the Paris Peace Agreement, took steps to protect its eastern border, especially in East Prussia, that was now separated from the rump of Germany by the so-called 'Polish Corridor'. A series of bunkers and pillboxes were constructed that were designed to provide a skeleton for more extensive defences in time of war; though the German high command recognised that even if fully manned the defences could do no more than slow an enemy attack.

With Hitler's accession to power in 1933 the fortifications programme in the east was accelerated and German Army engineers took the opportunity to build a series of increasingly large and elaborate fortifications along the border with Poland. However, when Hitler visited the defences in 1938 he was horrified with what he saw and called a halt to the work; the main focus of effort was now switched to the West Wall, which was to protect Germany's western border from French aggression in any future war against Czechoslovakia or Poland. In September 1939 war did come, but the campaign in Poland was short and neither the eastern nor western border defences were seriously threatened. Emboldened, Hitler turned his attention to defeating Britain and France. Some simple defences were constructed along the new border with the Soviet Union to protect his rear, but they proved unnecessary. Within six weeks of launching his attack in May 1940 France had surrendered and the British Expeditionary Force had been evacuated from Dunkirk.

With the prospect of war on two fronts gone, Hitler returned to the main prize – living space, or *Lebensraum*, in the east. In June 1941 Hitler's forces launched Operation *Barbarossa* and within a few months they were standing at the gates to Moscow. The following year more gains were made in the south, but by the end of 1942 the advance was running out of steam and in 1943 Generalfeldmarschall (Field Marshal) Friedrich Paulus' Sixth Army was encircled and destroyed at Stalingrad. With a further major defeat at Kursk in August 1943 German forces now went on the defensive. Hitler issued an order that called for large towns and cities to be turned into fortresses and for the garrisons to fight to the last man. He also endorsed the construction of a



A German concrete shelter constructed in World War I on the Eastern Front. The shelter is located near Dubatowka, Belarus. The inscription on the front reads 'ERBAUT II. BATL. L.J.R33.MAI 1917'. (V. Tadra)



Panzerwerk 716, part of Werkgruppe Scharnhorst. On the left is one of the *Sechsschartenturm* (20P7) – six-loophole armoured turret – while in the centre is a cupola for ventilation, with the observation turret (438P01) on the right.

series of defensive lines – albeit reluctantly, because he believed that they encouraged commanders to withdraw prematurely and this ran counter to his belief that German forces should hold onto every inch of territory that had been hard won.

Work on the defences commenced in the summer of 1943, but they were not large, permanent concrete structures, like the pre-war fortifications along the German border. Instead they were a mixture of field works reinforced with small, concrete positions. Nor were the defensive lines continuous, such was the length of the front, and they were often not built in depth; sometimes they were little more than lines on a map. More significantly, the German Army lacked the strength to man the defences let alone maintain reserves to launch a counterattack. This contrasted with a resurgent Red Army that had grown in size, was better led and was far better equipped than in 1941. These factors, combined with Hitler's meddling in every aspect of military operations, ensured that the Wehrmacht was unable to stem Stalin's summer offensive of 1943 and by October 1944 Soviet forces had reached the German border. All able-bodied men were now called up to protect the Reich. Their first task, along with women and youths, was to build new defences to protect the homeland. At the same time the old border defences, after years of neglect, were renovated. But it was too little too late, and in April 1945 Hitler committed suicide – somewhat ironically in a concrete bunker in Berlin. The following month Germany surrendered.

CHRONOLOGY

1919

January	Victorious powers meet at Versailles.

1927

January	Allied Control Commissions withdrawn.

1928

Work begins on eastern defences in Germany and East Prussia.

1929

Work on the Maginot Line begins.

1930

Allied army of occupation removed. Work begins on Pommern Stellung.

1933

30 January	Hitler becomes Chancellor. Work begins in earnest on defences of Oder-Warthe-Bogen.

1934

19 August	Hitler becomes head of state on death of Hindenburg. Work on first Werkgruppe (Ludendorff) begins.

1935

1 March	The Saar is returned to Germany.
November	Hitler's first visit to the eastern defences.

1936

7 March	Germany remilitarises the Rhineland.

1938

11 March	Germany annexes Austria.
May	Hitler's second visit to the eastern defences.
July	Hitler orders work on the eastern defences to stop.
29 September	Munich Agreement signed.
5 October	Germany occupies Czech Sudetenland.
November	Hitler makes his final visit to the eastern defences.

1939

14 March	Germany occupies Bohemia and Moravia.
1 September	Germany invades Poland (codename *Fall Weiss*).

1940

10 May	Germany launches offensive in the west (codename *Fall Gelb*).
22 June	France signs armistice with Germany.

1941

22 June	Germany invades the USSR (Operation *Barbarossa*).
December	Work on the Atlantic Wall begins.
11 December	Germany declares war on the USA.

1942

February	Fritz Todt is killed in an air crash.

1943

	The tunnels of the Oder-Warthe-Bogen are adapted for war production.

2 February	Germans surrender at Stalingrad.
5 July	Battle of Kursk (Operation *Citadel*)
September	Work on the Wotan/Panther lines begins.

1944

4 January	The Red Army enters Poland.
8 March	Führer Order 11 issued directing that key cities be transformed into fortresses.
6 June	Operation *Overlord*; Allies land in Normandy.
August	German cities in the east are given fortress status.
Summer	Work starts on renovating the pre-war eastern defences.
September	The Volkssturm is created.
16 December	Germans launch the Ardennes offensive.

1945

12 January	The Red Army launches its Winter Offensive.
29 January	The Red Army units reach the Oder-Warthe-Bogen.
30 April	Hitler commits suicide in the Führerbunker.
8 May	VE Day.

DESIGN AND DEVELOPMENT

German tradition of fortifications in the east

Germany and its antecedents had a long tradition of building castles and fortresses to protect their eastern territories. A number are worthy of mention, not only because of their strategic importance, but also for the role they played in the final battles of World War II. Arguably the most famous was the fortress of Königsberg (Kaliningrad). As early as the 13th century the Teutonic Knights (a German medieval military order) established a castle on the site of the modern city. A town developed around the castle and later grew to absorb two nearby villages. These three settlements were later protected by a wall and in the 17th century the First Defensive Belt was built – an 11km-long earthen bank which was some 15m thick. Largely untouched by the Napoleonic Wars, the city prospered, but by the middle of the 19th century it was clear that developments in weaponry had rendered the defences obsolete. As a consequence a Second Defensive Belt was built. It consisted of 12 bastions, 2 fortresses and 3 ravelins. However, such was the pace of change in military technology that a new ring of defences some 50km in circumference was constructed in the final quarter of the 19th century. This consisted of 11 forts (a further one was added later along with 3 smaller forts) each built from hardened red bricks with a 4m-thick earth roof.

Like Königsberg, Küstrin (Kostrzyn), which sat at the intersection of the Oder and the Warthe rivers, had been fortified as far back as the 13th century. These defences were expanded and strengthened by the Hohenzollerns and later by Gustavus Adolphus of Sweden. In 1806 the city was surrendered to Napoleon, who reinforced the defences; these were strengthened still further in the second half of the 19th century to protect what was now an important railway junction. However, as was the case in Königsberg, advances in military technology meant that the defences of the city were increasingly

irrelevant and in the first part of the 20th century many of the fortifications were given over to civilian use. This trend continued until the Nazis' accession to power when the city once again became an important garrison.

Between Königsberg and Küstrin were many more fortifications including Marienburg (Malbork) on the River Nogat, which had first been fortified in the 14th century and was still an important military stronghold in the early 19th century. Further upstream, on the Weichsel (Vistula) were the forts at Graudenz (Grudziądz) and Thorn (Toruń). After the Franco-Prussian War (1870–71) the defences of Thorn were strengthened with the addition of seven large and six small forts. At much the same time Posen (Poznań) on the River Warthe – again as a result of lessons learned from the Franco-Prussian War, and to combat developments in weaponry like rifled guns – was surrounded by a ring of nine large and three small forts. On the River Oder to the south were the great forts of Glogau (Głogów), Steinau (Ścinawa) and Breslau (Wrocław). The fortifications of the latter had been captured by Napoleon after a brief but bloody siege in 1807 and the ramparts were later dismantled so that it could never again provide such resistance.

World War I

On the eve of World War I the great fortresses of Königsberg, Küstrin and the like were seen as strategically important. They were garrisoned and armed accordingly and some of the defences were strengthened. However, in the end they played little or no part in the fighting. Initially, the fighting in the east, as in the west, was characterised by large, sweeping advances, but slowly descended into a bloody war of attrition. By the middle of 1915 the Central Powers (Germany and Austria–Hungary) had pushed the Russian Army back to a line running from Memel (Klaipėda) in the north through modern-day Belarus and Ukraine on a line taking in Baranovichi, Pinsk and Rovno (Rivne) before reaching the border of the Austro-Hungarian empire at Tarnopol. Trenches were dug along the length of the front and included deep dugouts to protect the infantry from artillery fire. In front were lines of barbed wire covered by machine-gun positions. As the stalemate continued permanent defences were constructed often using reinforced concrete. This started in 1916, but it was not until 1917 that significant numbers were built. And they were not just restricted to infantry shelters. Observation posts with loopholes were built, as were machine-gun pillboxes and even artillery shelters, which were located some miles to the rear along with concretised stores for ammunition. The design of the structures varied because, unlike in World War II, there were no standard plans. Nevertheless, the structures were often of a very high quality with field telephones and some with the facility to pump out water and protect against gas. It is not possible to establish exactly how many concrete positions were constructed, but it was a significant number. A 4km section between Lake Naroch and Lake Miadel in modern-day Belarus alone contained at least 120 structures.



A German World War I pillbox on the Eastern Front. This example had three embrasures and is combined with a concrete shelter (partly visible on the right). The pillbox is located near Salushje, Belarus. (V. Tadra)

The interwar period

In December 1917 the Germans agreed a peace deal with the new Russian government and, with the troops released, launched a new offensive in the west. This eventually ran out of steam and in November 1918 the Germans agreed to an armistice. In the following year formal peace negotiations began. The terms of the peace agreed at Versailles were punitive. Germany's eastern border was realigned and a new Polish state created with access to the sea. The military implications of this were twofold. Firstly, Germany was now split in two with East Prussia separated from the rump of Germany by the so-called Polish Corridor. Secondly, Germany now had a new neighbour – Poland – that was determined to secure its position and establish its borders. Initially, Poland looked east and in the spring of 1920 launched an attack towards Kiev. This was repulsed by the Russians and soon the Polish Army was forced to retreat towards Warsaw. The capital was saved after the 'Miracle of the Vistula' and in March 1921 the Treaty of Riga was signed that finally established Poland's eastern border.

For Germany, the volatility in the east was a cause for concern. Under the terms of the peace agreed in Paris, the German Army was limited to 100,000 men and Article 180 stipulated that 'The system of fortified works of the southern and eastern frontiers of Germany shall be maintained in its existing state.' This meant that the fortresses of Küstrin, Breslau and Glogau could be maintained, as could Königsberg and Lötzen (Giżycko), albeit that they were now separated in East Prussia. The fortifications of Graudenz, Thorn and Posen were now in Poland.

To ensure that the Germans complied with the terms of the peace, the Inter-Allied Military Control Commission (IAMCC) was created. The IAMCC included officers from the victorious nations, principally Britain and France, and in 1920 started work. However, with only 1,200 personnel to ensure compliance with the articles of the Paris Peace Agreement they were reliant on the German government to provide details of the fortifications and not to renovate, extend or build new ones. This trust proved to be misplaced and the German military took every opportunity to ignore or bend the rules and new defences were built in the east. However, limited numbers of engineering officers – the result of restrictions to the size of the army under the terms of the peace – meant that the plans were small in scale. Rather than a complete defensive line, the defences would act as a framework around which further defences would be constructed in time of war. Some small bunkers were constructed along the Oder and in front of Glogau and Küstrin and in East Prussia to protect Königsberg and Lötzen.

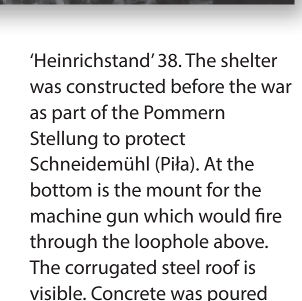
A Polish bunker constructed between the wars. This example has a single embrasure with a steel armoured observation cupola. This example is located near Darewo in Belarus. (V. Tadra)



Inevitably intelligence reached the Allies that this work was going on and the Conference of Ambassadors, which replaced the IAMCC in 1926, decided that, with a few exceptions, these defences should be demolished and that Germany should be prevented from fortifying her eastern borders. The German government paid lip service to

these restrictions and covertly continued to work on the defences. In 1928 survey work started along Germany's eastern border. East Prussia was given priority because it was considered most vulnerable. Work commenced on a series of defensive lines around the capital Königsberg. Firstly, there was the Frisching-Deime Stellung, or Samland Fortress, which ran from the Kurisches Haff (Lagoon) south along the River Deime to Tapiau (Gvardeysk). From here it extended westward to the Frisches Haff. This southern line was in turn protected by the so-called Heilsberg Stellung (or Heilsberg Triangle), a semi-circle of defences that ran from the Frisches Haff to Heilsberg and then on to the Frisching-Deime Stellung at Tapiau.

At that same time (1928) the first tentative steps were taken to fortify the border of Germany proper with the creation of a defensive line which was designed to block the most direct route to Berlin. It ran from the River Warthe in the north to the River Oder in the south and made extensive use of the lakes and rivers in the region. These were dammed and sluices built to allow the land to be inundated in time of war. This work was described as water management work to avoid suspicion and was paid for from non-military budgets. This line became known as the Nischlitz-Obra Line (it followed the line of the River Obra in the north to Lake Nischlitz in the south) and formed the eastern edge of the so-called Oder Quadrilateral – the northern edge formed by the River Warthe and the western and southern edges by the River Oder. A number of simple C-strength shelters were built to cover the water obstacles, some with garages for a *Panzerabwehrkanone* (anti-tank gun). Other field works would be constructed if war threatened, especially in the weak middle sector.



'Heinrichstand' 38. The shelter was constructed before the war as part of the Pommern Stellung to protect Schneidemühl (Piła). At the bottom is the mount for the machine gun which would fire through the loophole above. The corrugated steel roof is visible. Concrete was poured over the top.

The Nazi era

Following Hitler's accession to power the work on fortifications was accelerated and increasingly the tenets of the Paris Peace Agreement were ignored. In the east work started, or was extended, along the whole of the border with Poland. In East Prussia the defences of the Heilsberg Triangle were strengthened and new positions were created along the border. In the south-west the Hohenstein Stellung was established, and to the east of this was the Ortelsburger Waldstellung (forest position), which, as its name suggests, used the forest as a natural barrier. Work on this position began in 1936 with the construction of some minor defences and then, somewhat belatedly, it was strengthened in 1939. Perhaps the most impressive of the new defences, however, was the Lötzener Seenstellung (lakes position), work on which started in 1934; when completed it consisted of more than 230 positions of B1 strength. Interestingly, these defences provided a ring of defences around Rastenburg (Kętrzyn), where Hitler's principal HQ on the Eastern Front was built.

To protect Germany proper, work began on a series of defensive lines along the border with Poland. In December 1930 the first emplacements in what was to become the Pommern Stellung were started. However, the economic downturn meant that progress was slow and the defences were confined to the area around Deutsch Krone (Wałcz) and Neustettin

OPPOSITE
This map shows Germany's pre-war eastern border defences including the Oder-Warthe-Bogen (initially known as the Nischlitz-Obra Line), Pommern Stellung and the Oder Stellung. German pre-war place names are used.

(Szczecinek). In 1934 work was accelerated and by 1938 some 800 defensive positions had been constructed that stretched from Landsberg an der Warthe (Gorzów Wielkopolski) to the Baltic, though the adoption of a more aggressive stance towards Poland meant that the original plans were not realised in their entirety. In the period up until the invasion of Poland in September 1939 further light works right along the border were constructed, but again these were not completed.

In the south, the Oder Stellung protecting Silesia was established. This ran along the river that gave it its name as far as the fortress of Breslau (Wrocław). However, the Oder Stellung provided no protection from an attack from the south-east and as such in 1939 work began on the Oberschlesien Stellung (Upper Silesian Position) to protect the cities of Gleiwitz (Gliwice), Hindenburg (Zabrze) and Beuthen (Bytom) from Polish attack. Prior to this time the German high command had concluded that they would abandon Upper Silesia because it could be outflanked by an attack in central Silesia. This strategy changed after the Munich Agreement of 1938 and the subsequent invasion of Bohemia and Moravia.

Up to this point the defences of the Nischlitz-Obra Line – later the Oder-Warthe-Bogen (OWB) – which protected the most direct route to Berlin, relied on natural features to provide its strength. However, from the middle of 1933 more significant construction work began. In this first building phase, which lasted until 1935, a number of improvements were made to the defences. The water obstacles were strengthened with the building of swing and retractable bridges along with bunkers to protect them. Passive defences were also used including obstacles in the water. In 1934 construction work began on 12 Hindenburg stands – C-strength bunkers that were built over two levels. The following year a similar number of B- and B1-strength bunkers were built. These were self-contained positions that were designed for all-round defence.

This period also saw the evolution of the so-called *Werkgruppe*; a series of *B Werke* and other positions connected by tunnels. In 1934 work began on the first of these *Werkgruppen* – Ludendorff. Initially this consisted of three positions, but later three further positions were added. Ludendorff, like so many of the positions on the OWB, was unique. Indeed the OWB was used as a test bed to experiment and innovate. The concrete and steel of the shelters was tested at the Hillersleben test facility near Magdeburg (work on this facility began in 1935), but there was neither the time nor the resources to build and test bunkers here and reproduce the results on the eastern border. Consequently, the defences were developed in situ and the lessons learned used in subsequent phases.

One of the 'Type 102v' concrete shelters built near the rail tunnel at Stepina, Poland as part of Hitler's HQ. This example was located adjacent to the tunnel and was fitted with two loopholes – one in each room and accessed through separate doors.



After the remilitarisation of the Rhineland in 1936, Hitler

The defences along the pre-war German border



tested the Allies' resolve still further by extending the building programme in the restricted border zones. In the Second Phase of building, which ran from 1936 to 1938, a further nine *Werkgruppen* were constructed, seven linked by tunnels, in the critical central section of the OWB that ran from Kurzig (Kursko) to Starpel (Staropole) and centred round Hochwalde (Wysoka). This section of the border was heavily defended because it straddled the most direct route to Berlin and also lacked significant natural obstacles.

As well as *Werkgruppen* there were plans to construct more than 100 positions in this area including 15 works in strength A and 13 in strength A1. These were so-called 'Silent Works' armed with 100mm guns in turrets or casemates that would only open fire when the enemy reached the defences so as not to give away their position. However, the German armaments industry was not able to produce the armoured turrets, because steel of this quality was needed for other armaments, including tank production, so these plans made it no further than the drawing board (though foundations were laid for some).

Despite this, significant progress had been made between Hitler's initial visit to the Oder-Warthe-Bogen in November 1935 and May 1938 when he visited again along with Generalfeldmarschall Walther von Brauchitsch (Commander in Chief of the Army) and General der Pioniere (General of the Engineers) Otto-Wilhelm Förster (Inspector of Engineers and Fortifications). In addition to the nine *Werkgruppen* in the central section there were three in the north (including Ludendorff) and another in the south. However, Hitler was not impressed. He declared that the defences were not fit for purpose and in a memorandum of 1 July 1938 directed that from now on defences should be constructed in depth using trenches and smaller concrete positions, reminiscent of World War I. Unlike the French soldier, he argued, German troops should not be cooped up in massive bunkers. On 4 July he ordered work on the defences to stop, with all efforts now concentrated on the western border defences – the so-called 'West Wall'. In November Hitler visited the OWB defences again and ensured there was no doubt about his feelings on the subject, stating that the *B Werke* were 'worthless mousetraps without firepower with only one or two miserable machine-gun turrets' (Reiss 2006, p.141).

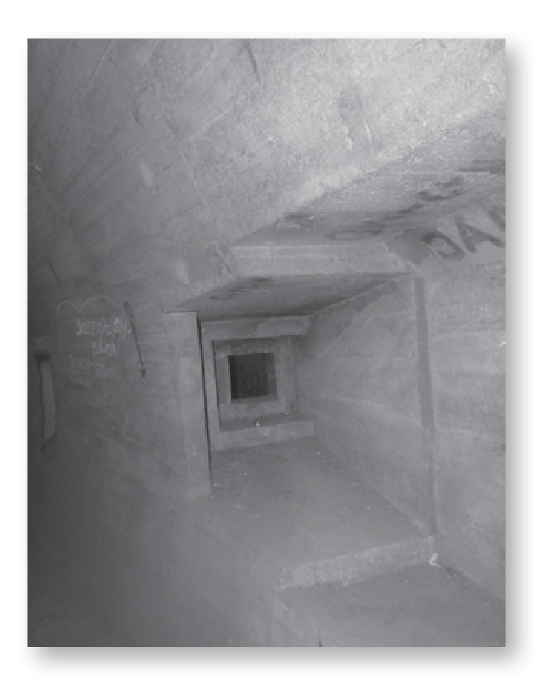


LEFT
The defences of the Oder-Warthe-Bogen took advantage of the natural obstacles in the area, especially rivers and lakes. A rotating bridge was constructed at Kurzig (Kursko). The concrete structure shown was used to secure the bridge when it had been rotated.



RIGHT
The *Kampfraum* – main fighting compartment – of Panzerwerk 778 (Pz.W. 515) at Burschen (Boryszyn). It is unusual in that the armoured plate (7P7) that would have protected the MG08 machine gun is half-covered by a concrete lip. The top half of the plate has been removed.

World War II – the years of advance



A loophole set in the side of the tunnel wall of the OWB for a machine gun. The concrete is stepped to avoid funnelling of enemy fire. Just behind this can be seen a further loophole for use with a small arm should the enemy advance this far. Beyond this (not shown) would have been a gate.

Work on the West Wall had largely been completed by 1 September 1939, when Germany invaded Poland. A few short weeks later, and aided by the Soviets, Poland was defeated and the spoils of war divided. To protect these territorial gains a series of new defences was commissioned. These were mostly field works, interspersed with some permanent positions.

In East Prussia the original defences were strengthened with the addition of the Narew-Pisa Stellung (otherwise known as the Galinde Stellung) which ran south from Johannisburg (Pisz), the Masurische Grenzstellung (border position) and Suwalki Sehnenstellung (Switch Position), which filled the gap between the Lötzener Seenstellung and the Heilsberg Stellung, and finally the Gumbinnen Grenzstellung which ran from Schirwindt (Kutuzovo) south to Bakałarzewo with the bulk of the defences around Ebenrode (Nesterov). To the north and south of Warsaw defences were built along the Narew, Weichsel (Vistula) and San rivers (hence its name – the San-Weichsel-Narew Linie). This line stretched for 430km and included almost 200 combat positions, 3,500 field bunkers (made from timber), more than 1,000 observation posts and a number of other permanent works.

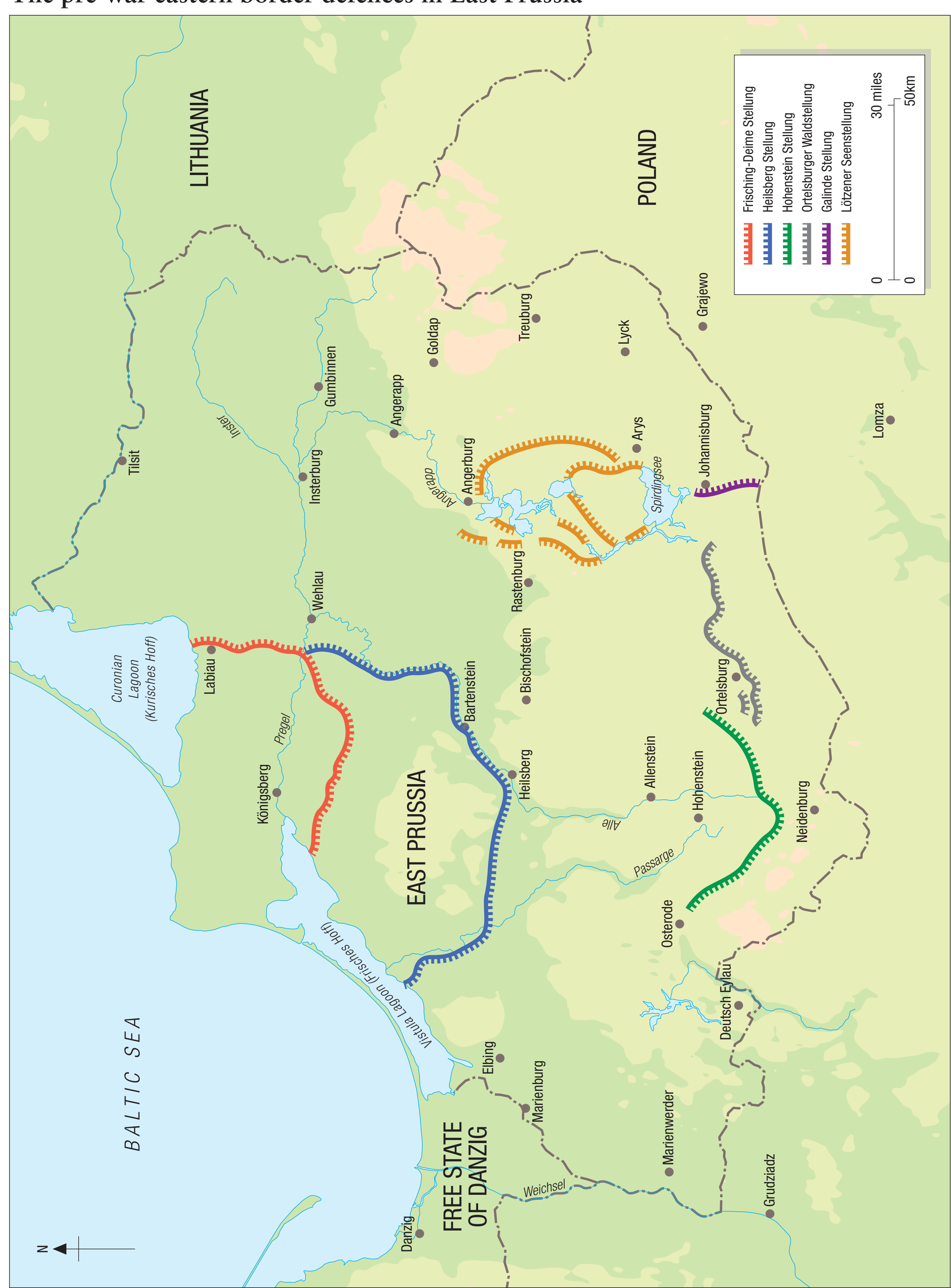
The semi-permanent nature of the defences was consistent with Hitler's aggressive foreign policy. In May 1940 Germany invaded France and the Low Countries. This campaign was successfully completed in six weeks and following the decision to postpone the invasion of Britain, German units were once again moved east, and on 22 June 1941 Hitler invaded the Soviet Union. By December they had reached Moscow and Leningrad and the following summer further offensives were launched. With no threat to Germany from the Soviet Union, weapons and machinery from the eastern defences were removed and used to equip the new Atlantic Wall defences.

Work on the Atlantic Wall started in 1942 and was designed to counter any cross-Channel invasion of 'Fortress Europe' from Britain. However, the Third Reich was also increasingly threatened by Allied bombing. Already in the autumn of 1940 the RAF had started to bomb Germany and in 1942 they were joined in the endeavour by the US Air Force. The principal target was German industry, especially armaments and munitions factories. One solution to the problem was to move production underground and an obvious location was the now-abandoned tunnels of the OWB. Some limited work was undertaken to adapt the tunnels and in 1943 Daimler moved production of aircraft engines there. Workers, many of them forced labourers, were housed in the accommodation previously used by workers on the defences near Hochwalde (Wysoka) along with new camps nearby. The tunnels were also used to store a variety of things including uniforms, documents and, later, works of art.

World War II – the years of retreat

In 1943 when the tunnels of the OWB were being adapted for their new wartime role, German forces on the Eastern Front were everywhere being pushed back. As early as February 1943, after the defeat at Stalingrad, Erich

The pre-war eastern border defences in East Prussia



von Manstein had recognised the need to add depth to his position and argued for the construction of defensive positions along the Dnepr. However, it was not until it was clear that the Kursk offensive had failed that, on 11 August 1943, 'Hitler very belatedly authorised work to start on the Ostwall' (Melvin 2011, p. 386). This was to 'begin in the south on the Kerch Peninsula, continue on the mainland at Melitopol, run in an almost straight line to the Dnepr near Zaporozhye, swing eastward around Zaporozhye in a large bridgehead and follow the Dnepr north-west to Kiev with bridgeheads east of the major cities. North of Kiev it was to follow the Desna River to Chernigov and then run almost due north along a line somewhat east of the cities of Gomel, Orsha, Vitebsk, Nevel and Pskov to the southern tip of Pskov Lake. From there it would continue north along the western shore of the lake and the Narva River to the Gulf of Finland' (Ziemke 1968, p.154). However, since the term *Ostwall* or 'East Wall' gave it an air of permanence and invincibility that it did not merit, the Oberkommando des Heeres later in the month adopted two more innocuous code names: Wotan Line in the army groups South and A zones and Panther Line in the army groups North and Centre zones. The Panther Line joined the Wotan Line at Zaporozhye.

OPPOSITE
This map shows the six key defences of the Frisching-Deime Stellung, Heilsberg Stellung, Hohenstein Stellung, Ortelsburger Waldstellung, Galinde Stellung (also known as the Narew-Pisa Stellung), and the Lötzener Seenstellung.

The more substantial of these two positions was the Panther Line. Work began on 8 September 1943 with some 50,000 workers, many of them from the civilian population, constructing some 6,000 bunkers (though only 800 of these were concrete – the rest were timber because the winter weather made the pouring of concrete impossible) which were protected by 200km of barbed wire and 40km of trenches and tank traps. The strongest portion of the line was in the north where the defences were built in depth. Further south the defences were less advanced partly because of the short time available and also because some of the Organisation Todt personnel, who were to build the defences, had been diverted to undertake tasks as part of Hitler's scorched earth policy. Because of this, and the fact that the southern portion of the line was already threatened by Soviet advances, a further defensive position was built along the western bank of the Dnepr – the so-called Bear Line (or Panther II Line) that ran south of Mogilev.

Although the raw statistics looked impressive on paper, they could not disguise the fundamental weaknesses of the eastern defences – they were incomplete, not built in depth and nor were they fully manned. Unsurprisingly then the 'East Wall', or 'Eastern Rampart', failed to stem the Soviet summer offensive in 1943 when Stalin launched 19 simultaneous thrusts along a 1,000km front. Army Group Centre was pushed back to the Dnepr and in places the Soviets secured bridgeheads on the west bank of the river. It was clear that further defensive measures would need to be taken if the German forces were to stop the Soviet advance. Generaloberst (Colonel General) Heinz Guderian argued that a series of defensive lines should be constructed starting on the Vistula (and the Bug) with particular emphasis around Warsaw. Plans were drawn up for positions named a, b, c and d and responsibility was given to party leaders for raising the work force and overseeing the work. 'Guderian worked out the necessary programme



From the main tunnel of the Oder-Warthe-Bogen it is possible to access a narrower tunnel that runs parallel to the main thoroughfare. Troops could move along this but only crouched over. A room further along allowed the troops to stretch, before progressing further.



During the German occupation of the Soviet Union the Germans built a number of concrete defences. This is a simple cylindrical pillbox built in the period 1942–43. It is located on the outskirts of Baranovichi in Belarus. (V. Tadra)

of construction with General Alfred Jacob, chief of engineers at the OKH, and he revived the recently dissolved Fortifications Department of the General Staff in order to evaluate fortifications in general' (Duffy 1991, p.374).

The defences covered the section of the front from the lower Vistula/ Pomerania to the Carpathians. The furthest east of these was the a1 Stellung (position) which ran along the River Dunajec in the south to Tarnow and then followed the River Pilica to Tomasów, before following a line eastwards to the Vistula and from there northwards, taking in Warsaw, to the defences of East Prussia. To the rear of this was the a2 Stellung and behind this was the b1 Stellung. The b1 Stellung ran from the Carpathians, west of Kraków, north to Tschen-Stochau (Czestochowa) then to Leslau (Włocławek) before following the Vistula from Thorn (Torun) to Graudenz (Grudziądz) and north towards Danzig (Gdańsk) on the Baltic. In the south, between Leslau and Tschen-Stochau, the b1 Stellung was screened by a further defensive line, the b2 Stellung.

The c Stellung ran south from Schneidemühl (Piła) to Posen (Poznań) before heading in a south-westerly direction to Glogau (Głogów), and in some sources is referred to as the Posen-Schneidemühl Stellung. The d Stellung ran from the southernmost point of the OWB through Glogau before splitting, with the d1 extension protecting Breslau (Wrocław) and the d2 extension running behind this and linking into the outer defences of the city.

In East Prussia the responsibility for constructing the new defences fell to Gauleiter (regional Nazi leader) and Reichsverteidigungskommisar (Reich's Defence Commissar) Erich Koch and he embraced the task with alacrity. Day-to-day responsibility for manpower and providing materials was given to Kurt Knuth while the army would second engineers to provide expert advice on how and where the defences should be constructed. However, the army either did not have, or could not spare, enough engineers and as such, 'Many of the trenches were too shallow, or in completely the wrong place' (Buttar 2010, p.35).

A F Pz DT 4804 (essentially a modified Panzer II turret) installed to the north-west of Kraków, Poland. It is fitted with a larger 3.7cm gun but was still woefully inadequate against the heavily armoured Soviet tanks deployed by the Red Army in 1944. (Waldemar Broskwinia)



As well as defensive lines, Hitler also ordered that important cities and towns be turned into fortresses, or *Festungen*. On 8 March 1944 Hitler issued Führer Order 11 which saw the creation of 26 'fortified areas'. These ran from Reval (Tallin) on the Baltic to Nikolayev near Odessa on the Black Sea taking in Minsk and Vinnitsa – which ironically had previously been the site of one of Hitler's forward headquarters where he oversaw operations to conquer Russia (others included Ternopol, Proskurov, Kovel, Brody, Pervomaysk, Bobruisk, Mogilev, Orsha and Vitebsk).

Each Festung was commanded by a senior officer who was ordered to defend the fortress to the last man.

By the summer of 1944 it was clear that Germany proper was now threatened and in August 1944 Hitler ordered that eastern German cities were similarly to be declared fortresses. These would resist the Soviets to the last man and in so doing would slow the Soviet advance and enable the Wehrmacht to regroup and defeat the Red Army. The cities identified included Königsberg, Lötzen and Pillau in East Prussia; Breslau and Glogau in Silesia, Küstrin and Frankfurt an der Oder in Brandenburg; Danzig, Bromberg, Thorn, Graudenz and Marienburg in Danzig, West Prussia as well as Posen and Warsaw. In point of fact most of these were fortresses in name only. Little had been done to fortify the cities and instead reliance was placed on the original defences which, although often strong, had been designed for war in a different era.



Front elevation of a 'Heinrichstand' (Regelbau D5 MG Schartenstand). This was constructed before the war to protect Schneidemühl (Piła). The framework was corrugated metal (*Wellblech Schalung*) over which the concrete was poured. The loophole for the machine gun is situated at the front; it would have housed an MG08.

At the same time – summer 1944 – Guderian, now Chief of Staff of the Army (Chef des Generalstab des Heeres), was given permission to restore the eastern defences in East Prussia and on the eastern border. He wasted no time and, 'Together with the General of Engineers at OKH, General Jacob, I provided a construction plan. I ordered the reformation of my former disbanded Fortress Detachment of the General Staff under Oberstleutnant Thilo to oversee the construction' (Kissel 2010, p.5). Work to renovate and strengthen the Oder-Warthe-Bogen defences was undertaken by Gottlieb Tesch, a well-established German construction company, which had until then been employed in adapting the tunnels for military production. Work began on field fortifications, including some 200 Tobruks, but this work took a disproportionate amount of time, because of the adverse weather, and as a result it was not possible to complete the missing *Panzerwerken*; none of the planned A- and A1-strength positions were completed.



THE PRINCIPLES OF DEFENCE

Strategy

In the interwar period and in the war itself, fortifications played a critical part in Hitler's strategic thinking. Almost immediately after coming to power he began to rearm in direct contravention of the terms of the peace agreed at Versailles. Initially the strategic imperative for this rearmament was presented as a response to her neighbours' refusal to disarm. France, Belgium, Holland, Poland and Czechoslovakia had large



A 7.5cm Kampfwagenkanone L/24 in Sockellafette. Essentially this was an obsolete tank gun that was mounted on a simple framework and used as an anti-tank weapon. This example was used near Frankfurt an der Oder and is now housed at the Militärhistorische Museum der Bundeswehr in Dresden.

armed forces and all had built defences along their borders with Germany. Germany argued that it should be allowed to do likewise. Unable to take the moral high ground, and with no appetite for war to force the issue, Britain and France allowed Germany to rearm. The Rhineland was remilitarised, the army and navy were strengthened and an air force created. Fortifications were built on the western border and also in the east, including East Prussia, which was separated from Germany by the Polish Corridor.

Initially the defences were modest, as Germany was constrained by limited resources, but later the size and scale of the border defences increased as Hitler ordered a massive expansion to the building programme. This was not driven by an increased threat to Germany's borders, but rather by a more aggressive foreign policy adopted by the Nazis. If Hitler was to restore Germany's pre-war borders (and even make further territorial gains) then it was highly likely that he would have to go to war. The much-weakened German armed forces (even after the expansion introduced by Hitler) could not hope to fight and win a two-front war. Therefore steps had to be taken to fortify Germany's borders.

After the absorption of Austria and Czechoslovakia into the greater Reich, Hitler's next target was Poland and, more importantly, re-establishing a land link with East Prussia. However, further aggression in the east would undoubtedly provoke a response from Paris and London. To mitigate this risk, the so-called West Wall was constructed along the border with France. This, it was hoped, would deter, or at least slow a French attack, and allow German forces time to defeat Poland and then move her forces west. The eastern defences meantime would provide a safe muster point for the invasion troops, but equally significantly prevented the Poles attacking towards Berlin. This allowed the Germans to mass their forces in East Prussia, Pomerania and Silesia and enabled them to carry out the devastating double envelopment of the Polish forces in 1939. Without this bulwark, such an operation would have been risky, if not impossible.

A door through to one of the ammunition rooms. The doorway is fitted with a wooden surround and the door was also wood, possibly to reduce the chances of creating a spark and detonating the explosives.



The strategy proved to be extremely effective – Germany defeated Poland and although France did launch some small-scale attacks against the West Wall they did not seriously threaten Germany's borders. In May 1940 the strategy was repeated again. Although Germany had a non-aggression pact with the Soviet Union, Hitler did not trust Stalin and defences were built along the new border with the Soviet Union. In the end the defences were untested and France was defeated and the British Expeditionary Force evacuated.

Thus far Hitler's strategy had worked almost perfectly, save for the fact that Britain was still undefeated. Unperturbed, Hitler prepared for his greatest gamble yet; the invasion of the Soviet Union, which he launched in June 1941. Initially the plans went well but by the end of 1942 the tide was beginning to turn, and in the west there was a growing threat of invasion now that the United States had joined the war against the Nazis. Hitler once again reverted to type and embarked on an even more ambitious building project to fortify the coast of occupied Europe in the hope of repeating the success of 1939. But the Soviet Union was not Poland and Britain and the US were not like the Western democracies in

the 1930s trying to avoid a second European conflagration. 'Fortress Europe', as it became known, would be attacked – it was just a case of when.

In the east, it was clear that after the reverses of 1941 and 1942 the Red Army would not be defeated quickly and by 1943 Stalin's forces were on the offensive. With neither the men nor the materiel to launch large-scale offensives, Hitler adopted a 'hold what we have' strategy. This proved disastrous as the army was refused permission to retreat even when the situation was hopeless, meaning that divisions, even whole armies, were encircled and destroyed.

In June 1944 the Allies landed in Normandy and pierced the 'impregnable' Atlantic Wall. Germany was now fighting on two fronts (three if you count Italy) and was being pummelled by increasingly heavy air raids. Still Hitler insisted that victory was within grasp and many in Germany believed him, but others recognised the futility of the strategy that Hitler had adopted. Elements in the army tried to kill the Führer and later some of his closest lieutenants made secret overtures to the Allies for peace, but these were rebuffed. The Western Allies and the Soviets continued with their strategy of unconditional surrender until May 1945 when they achieved their aim.

Operational factors

To deliver Hitler's strategic aims, the military was tasked with building a series of fortifications to defend Germany's borders and as in France a decade before, the size, shape and location of these defences generated an enormous amount of discussion. In France, drawing on lessons learned in World War I, especially the fighting for the forts of Verdun, the high command decided to build a line of immensely strong forts. These were situated all along the border with Germany and were designed to prevent future aggression. And the idea was adopted to a greater or lesser extent by France's friends and allies, principally Czechoslovakia and Belgium, but also the Netherlands and Poland.

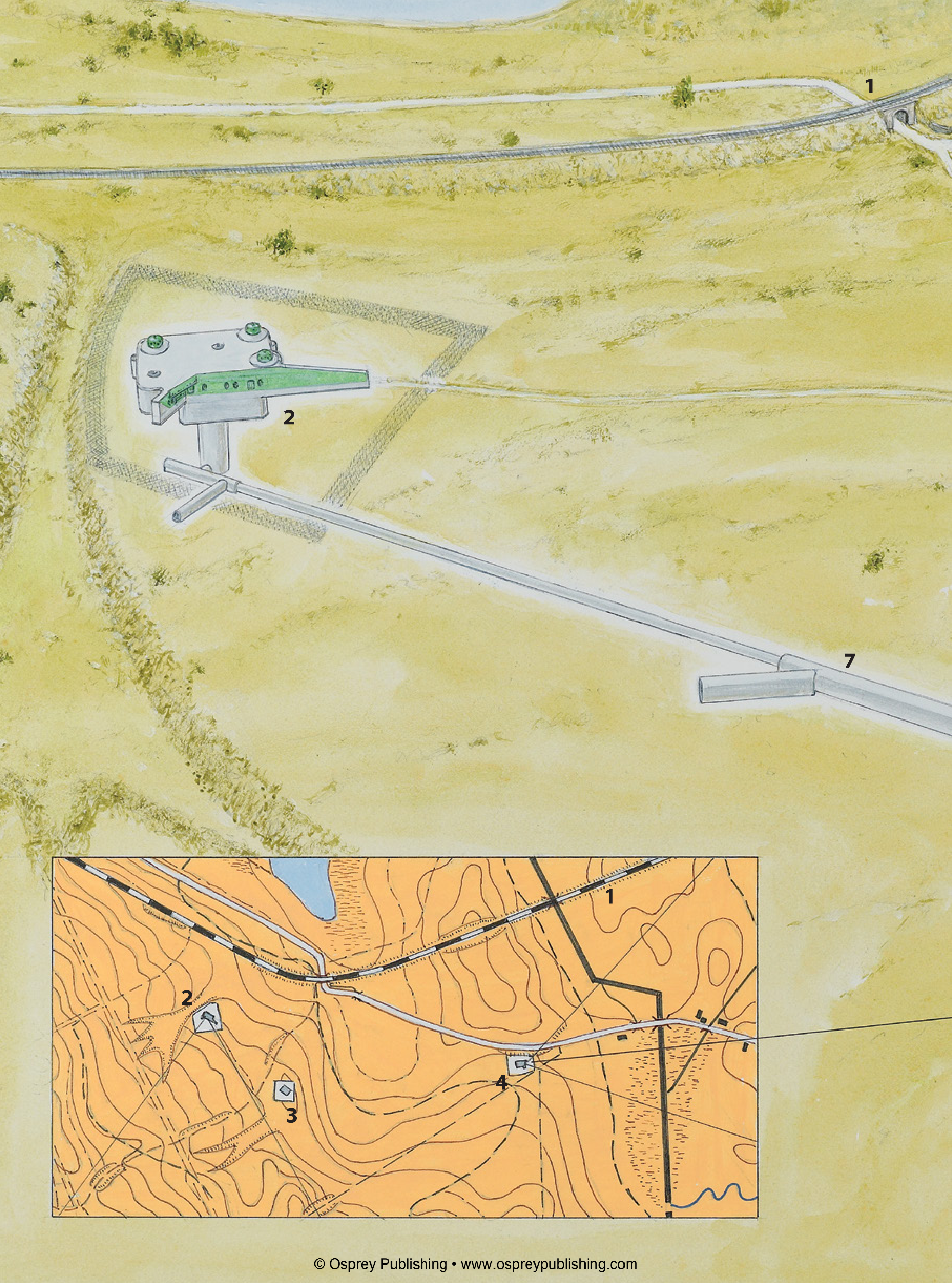
Germany, by contrast, was unable to follow suit, because of limitations imposed under the terms of the Paris Peace Agreement and by the state of the economy; after the war the country had been saddled with enormous reparations and in October 1929 there came the Wall Street Crash, which sent ripples around the world and meant that there was little money to spend on defence. These restrictions meant that Manstein, then Chief of the First Department of the General Staff (*Truppenamt*), could not implement his favoured plan of defences along the entire border, so in East Prussia in 1931 and 1932 he advocated the development of the so-called Heilsberg Triangle – a series of defences in the centre of the region which would resist Polish

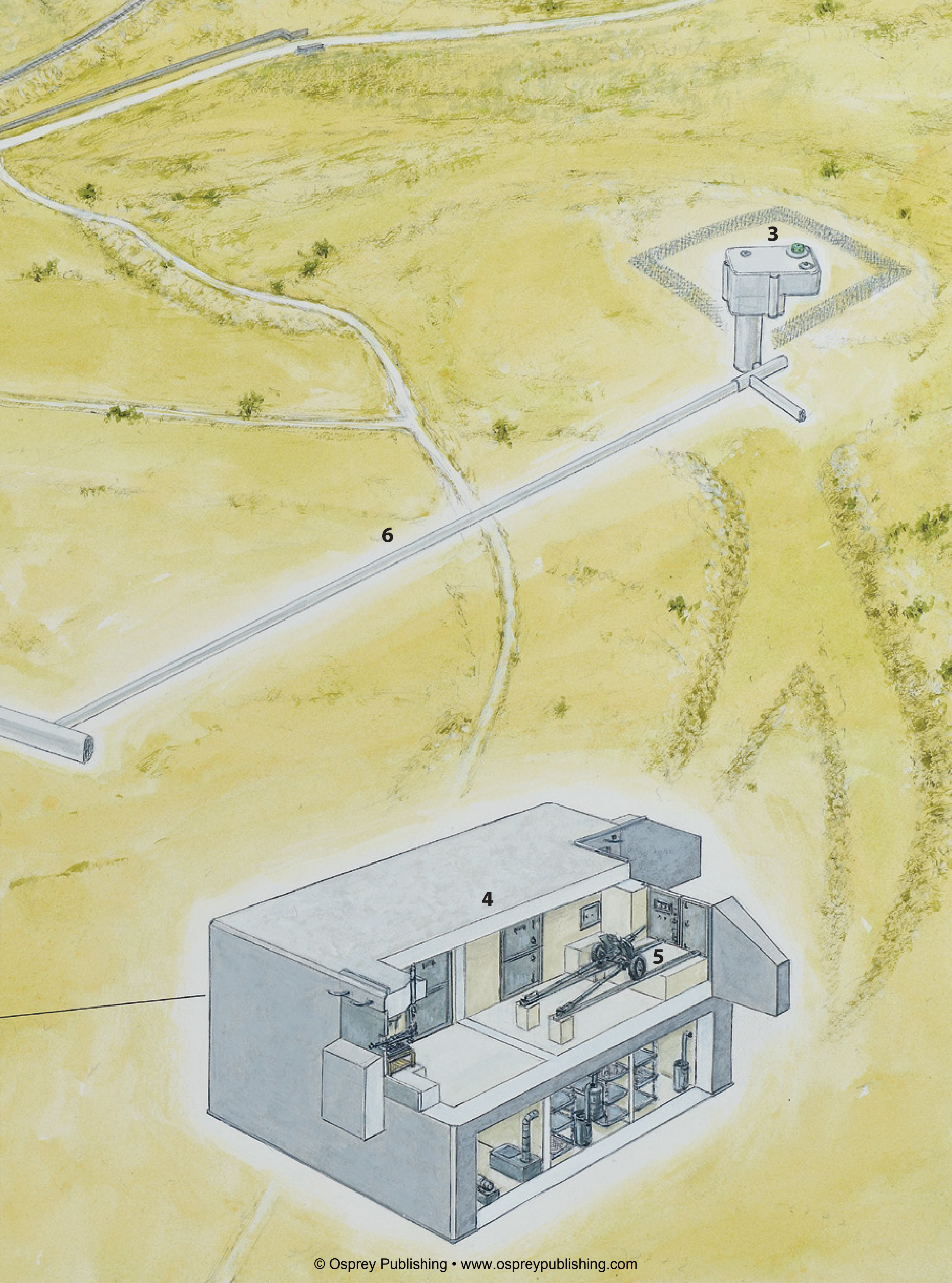


NEXT PAGE: WERKGRUPPE SCHILL

Werkgruppe Schill was situated in the central section of the Oder-Warthe-Bogen, near the town of Kurzig (Kursko) and protected the railway line from Meseritz (Miedzyrzecz) to Zielenzig (Sulęcin) (**1**). Werkgruppe Schill consisted of two positions (shown in the main illustration in aerial view) – Panzerwerk 757 (**2**) and Panzerwerk 754 (**3**) – and was supported by a further position (MG. u. PaK. 755, **4**) that housed a 3.7cm anti-tank gun (**5**). Panzerwerk 757 was a two-storey *B Werk* with two six-embrasure armoured turrets, M19 grenade launcher and armoured observation turret. Panzerwerk 754 was smaller and was fitted with a six-embrasure armoured turret, M19 grenade launcher and observation turret. The two works were connected by tunnel (**6**). Midway between the main bunkers were a series of galleries (**7**) that accommodated soldiers, machinery and stores.

The anti-tank shelter, MG. u. PaK. 755, was built in 1935 as part of the Nischlitz-Obra Line and was a 'Hindenburg' shelter (the base was constructed from brick). The 3.7cm anti-tank gun was housed in a garage and could be removed through armoured doors and moved to a prepared position for use.


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A very unusual room, which was fitted with a series of openings in both the walls and the ceilings (shown here). It is not clear where they led or what their purpose was, but most likely it was some kind of communication centre.

aggression until German forces could be mobilised.

In the following year the Nazis came to power and the political landscape changed. Almost immediately Hitler challenged the terms of the peace agreement signed in Paris, including the restrictions on fortifications along Germany's borders. At the same time his 'economic miracle' meant that funds were available to build the defences. But still there was no agreement on what the defences should look like.

In World War I Colonel Fritz von Lossberg, Chief of Staff of the German First Army, developed the idea of flexible defence in depth. Developing this further, Armed Forces Minister (and Supreme Commander of the Wehrmacht) Generalfeldmarschall Werner von Blomberg, supported by Manstein, argued for the construction of numerous smaller concrete installations along the border. However, the Inspector of Engineers and Fortifications, General der Pioniere Otto-Wilhelm Förster, supported by the Commander-in-Chief of the Army, Generaloberst Werner Freiherr von Fritsch, and Chief of the General Staff Generaloberst Ludwig Beck, favoured prepared battlefields or *Festungskampffelder*, with larger bunkers or groups of bunkers, similar to the Maginot Line, concentrated at more vulnerable sections of the border.

In November 1935 Hitler (who had always shown a personal interest in fortifications) visited the Oder-Warthe-Bogen and concluded that Förster's solution was preferable and work proceeded on that basis. Plans were now put in place for the construction of powerful forts in strength A and B. When Hitler visited the defences again in May 1938 work was well advanced with many of the *B Werke* completed. Hitler inspected the fortifications and was dismayed with what he saw. The defences were very strong but lacked weaponry. Hitler ordered that the work be stopped, but, equally significantly, he made a volte-face in respect of the form the defences should take and now advocated the construction of lots of smaller machine-gun bunkers – and this is the model that was followed in the West Wall, where he ordered all energies were now to be focussed.

In the short term the merits and demerits of the different border defence plans did not matter because by the end of 1941 the war was being fought well away from Germany's frontiers. However, by the middle of 1943 the German high command was once again considering the possibility of creating a new defensive line in the east. This, though, was anathema to Hitler. Firstly, he was convinced that once a line had been built soldiers and officers alike would not defend their current positions, preferring instead to retreat to the safety of the prepared defences. Secondly, Hitler was obsessed with the idea that 'ground must be held at all costs', which severely limited the army's freedom to manoeuvre. Ideally they would have withdrawn to a shorter front that could be more heavily fortified, but instead the new 'East Wall' was built along the Dnepr and only in the north was it built in depth.

The consequence of this decision was that the thin defensive line was soon broken and rolled up. Further lines were planned but with limited resources available they were often little more than lines on maps. Equally illusory were

the so-called 'fortresses' or *festungen* – cities and other strategically important locations that were to be defended to the last man. In fact, little or no defensive work was done to protect these fortresses meaning that large numbers of men were cut off when the Soviets advanced and with no prospect of relief, they were either killed or captured. Belatedly, Hitler agreed to the renovation of the defences along Germany's pre-war borders, but it was too little, too late.



One of the metal covers above the narrow gauge railway point in the tunnels of the Oder-Warthe-Bogen. This is particularly interesting because the date mark is 1940 – two years after work on the defences was suspended. BVG stands for 'Bochumer Verein für Bergbau und Gußstahlfabrikation'.

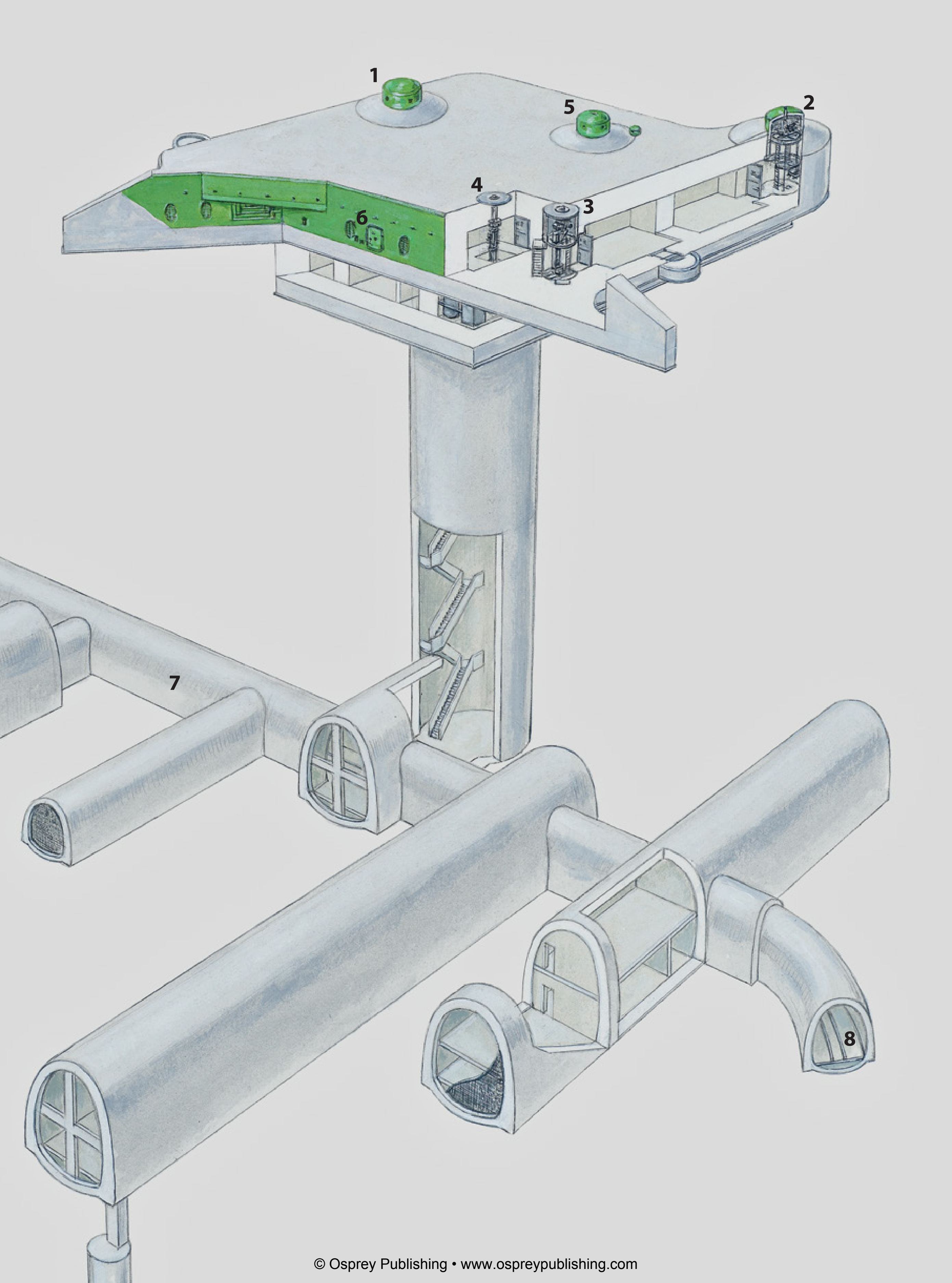
Tactical aspects

In November 1935, Hitler sided with Förster, Fritsch and Beck and endorsed the idea of the prepared battlefield. It now only remained for the fortifications to be designed and constructed. Wherever possible, and certainly in the Oder-Warthe-Bogen and East Prussia, the defences were constructed to take advantage of natural features like lakes, rivers, forests and hills. This was a well-accepted principle, but the concrete defences themselves were new. Indeed, the fortifications constructed in the interwar period in the east were used as a test bed and therefore tactical mistakes were made. Some only had loopholes at the front and were therefore susceptible to direct enemy fire; some were located on forward slopes rather than to the rear and were therefore vulnerable to enemy fire; and others were poorly positioned and did not benefit from interlocking fields of fire.

There were also issues with the larger, more powerful *B Werke*. Machine guns located in steel cupolas provided the crew with all-round observation and fire, but these turrets were vulnerable to direct enemy fire (as was demonstrated in 1940 in the fighting for the Maginot Line). Though very advanced, the weaponry for such large positions provided limited firepower when compared to the strength of the positions and the crew needed to man them. Moreover, the permanent defences of the Oder-Warthe-Bogen completely lacked anti-tank weapons, a major tactical flaw in an age where the tank was an integral part of any modern army (though plans had been developed for A-strength shelters fitted with larger calibre guns for direct and indirect fire support).

The tactical frailties of the permanent defences were not exposed in the first part of the war, but those of the less elaborate semi-permanent defences constructed in the Soviet Union and Poland were. By 1943 the German forces in the east were increasingly fighting defensive battles. To meet the threat from the Soviets, German forces initially used the hedgehog system of mutually supporting strong points. However, the system relied on adequate reserves, mobility and firepower to launch successful counterattacks, and increasingly this could no longer be guaranteed. Moreover, the Soviets were highly mobile and could deliver superior firepower – Soviet tanks were much better suited to the terrain, especially in the mud.

The answer was a continuous line of trenches, reminiscent of World War I, strengthened with semi-permanent steel and concrete structures to protect important and vulnerable sections of the front. However, many of the lessons learnt from the earlier conflict had been forgotten. Firstly, troops on the ground were inexperienced at building shelters to protect them from enemy artillery


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and ground attack aircraft. There were a number of reasons for this. It was partly due to the fact that the soldiers had been able to rely on other organisations to build defences (like the Organisation Todt). Partly it was the result of the type of warfare that had been conducted up to that point. Blitzkrieg, or 'lightning warfare', as employed by the Wehrmacht in the first years of the war, did not involve building strong defences once territory had been captured to consolidate the gain; rather it involved keeping the enemy off balance and driving forward to the next target. By the time the Soviets went on the offensive in 1943, using massive force to rupture the front and exploit the breach, it was too late to learn this field craft. And of course by this time the Germans had suffered massive losses of men which meant that much experience was lost, including amongst the pioneers, who were the experts in this area.

Not only had the Germans forgotten how to construct defences, but also the value of constructing defences in depth. Troops were often massed in forward positions in the so-called *Hauptkampflinie* (main battle line) to meet the enemy offensive and were decimated by enemy artillery fire. Only at the end of the war was Guderian able to persuade Hitler of the importance of defence in depth, but even then the Supreme Commander's meddling meant that any advantage was lost. Guderian had suggested the creation of a *Grosskampf HKL* (Major Battle HKL) well behind the main battle line and beyond the range of the enemy artillery. However, Hitler, determined not to relinquish territory, ordered the second line be built only 2–3km behind the HKL, and in the renewed Soviet offensive of January 1945 the German lines were destroyed by massed artillery and swiftly breached. Hitler was incandescent with rage and demanded to know who had ordered the defences be built so close together. When the minutes of the meeting in the autumn made it clear that it was him, he let the matter drop. In later battles he recognised the error of his ways and ordered the second line be built much further to the rear and when an attack was imminent, commanders were to withdraw their troops to this position to avoid being caught in the enemy barrage. In the fighting



The *Notausgang* or emergency exit in Panzerwerk 717. The opening into the shelter was secured with a steel door which is just visible on the right. If the crew needed to escape they would open the door, remove the brick wall at the end of a short tunnel and scale a ladder to the surface.

B

B WERK – PANZERWERK 717

In the north and south of the Oder-Warthe-Bogen engineers took advantage of physical features, particularly water obstacles, to strengthen the defences. In the central sector where such features were largely absent, they had to build stronger concrete defences. It was here that the majority of the *B Werke* were constructed – the most powerful of the defences built in the east. These were often combined into *Werkgruppen*, essentially a series of *B Werke* and other permanent positions linked by tunnels. One of the most famous of these was Werkgruppe Scharnhorst – not least because it survived the war largely intact and can be visited today. It consisted of three *B Werke* – Pz.W. 716, 716a and 717.

B Werk 717 was typical. It was fitted with two armoured cupolas (20P7, **1** and **2**) each with two machine guns that could be moved to any of six apertures in order to give all-round fire. In addition, the position was fitted with the most advanced M19 automatic mortar system firing through the roof via an armoured cloche (424P01 – **3**) and a flamethrower (**4**) which could be elevated periscope-like to give a full 360-degree arc of fire. When not in use it was protected by a steel cover (420P9). Observation for the crew was provided by means of an armoured turret (438P01 – **5**). An MG34 or MG08 fixed behind an armoured plate (7P7), provided flanking fire to cover the main entrance (**6**).

The bunker was constructed over two levels and was linked to a series of subterranean galleries (**7**) which were used for machinery, munitions and accommodation. These galleries were in turn linked to the wider tunnel network that was provided with a narrow gauge railway (**8**) that enabled the easy movement of men, munitions and stores from entrances at the rear to the fighting positions.



A series of defences was built before the war as part of the Pommern Stellung to protect Schneidemühl (Piła). Later in the war these were strengthened with the addition of Tobruk shelters. The positions were linked together with trenches, as shown here.

for the Seelow Heights in April 1945 this tactic was very much in evidence and helped to stall the enemy attack as General Vasily Chuikov, commander of Eighth Guards Army, later conceded.

TOUR OF THE SITES

Following the Nazis' accession to power the scale and speed of fortification construction was ramped up. The work also became more structured. In August 1933, only eight months after Hitler became chancellor, 'The Instruction for Construction of Permanent Fortification Structures' was issued. This detailed a series of construction types along with the thicknesses of walls, ceilings and armour for each one (see Table 1). In the following year work began in earnest to fortify Germany's eastern border and engineers were able to use this as a broad framework for constructing the defences. In tandem, standard bunker designs were developed. The Army Inspectorate of Fortifications developed these standardised models for a number of reasons. Firstly, it simplified the planning and building process; once a design had been chosen for a location, the raw materials needed, the labour required and the time needed could all be calculated, which in turn simplified the calculation of costs. Secondly, it enabled the production of standardised components like armoured doors and air filters.

The most powerful bunkers, both in terms of protection and weaponry, were the Type A. These were designed to provide anti-tank defence and indirect fire. To that end they could take a 50mm anti-tank gun (50mm PaK K L/70) either installed in an armoured turret or in a casemate. Indirect fire was to be delivered by the 105mm Mittlere Kanone (medium cannon). However, although plans were developed and some initial work was started, none of these were completed. Förster and his staff had initially concluded that defences of this strength were not necessary because the Polish artillery was not sufficiently strong. In the end there was a more practical reason for their non-inclusion. The armoured turrets required an enormous amount of high-quality steel which was needed for other armaments, particularly tanks. Some of the bunkers constructed to protect bridges were built in strength Type A, but were not weaponised.

The loophole covering the main entrance to Panzerwerk 717 (part of Werkgruppe Scharnhorst). The stepped concrete embrasure ensured that incoming fire was not funnelled towards the loophole. Behind this was a steel plate (7P7) with opening for the MG08 and an observation slit.



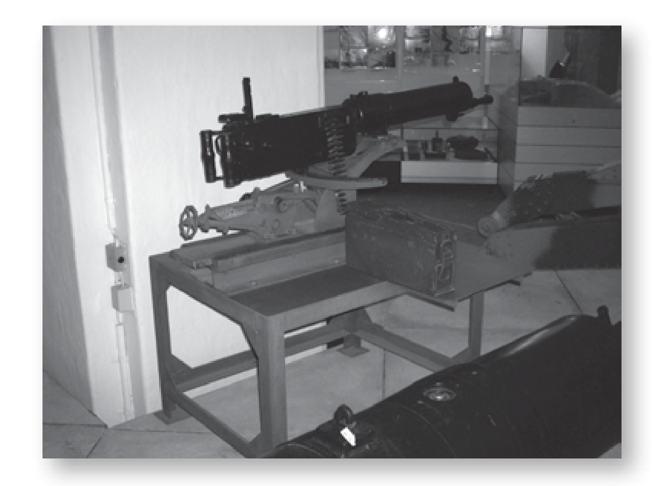
With no structures of Type A built, the most powerful positions were Type B and of these the most significant was the *B Werk*. This was constructed over two floors with stairs between them. The entrance to the *B Werk* was protected by a machine gun which covered an armoured door. Behind this was a deep pitfall which was covered with a plate that could be raised when the position was under attack. The position was armed with at least one *Sechsschartenturm* (six-loophole armoured turret) fitted with two machine guns. Indirect fire support was provided by a 50mm M19 mortar specially designed for use in fortresses. It could be rotated 360 degrees and was

Table 1: The Instruction for Construction of Permanent Fortification Structures				
Type	**Concrete thickness (m)**	**Steel thickness – cupolas (cm)**	**Steel thickness – armour plate (cm)**	**Bunker types**
A	Exterior 3.5; Interior 1.0; Ceiling 3.5	60	25–52	30, 30a, 36, some types over 100, *A Werke*
A1	Exterior 2.5; Interior 1.0; Ceiling 2.2	42	25–35	35, *A1 Werke*
B alt (until 23/12/38)	Exterior 1.5; Interior 0.8; Ceiling 1.5	25	20	1 to 36, *B Werke*
B neu (from 23/12/38)	Exterior 2.0; Interior 0.8; Ceiling 2.0	25	20	96, 100, 500 and 700 series
B1	Exterior 1.0; Interior 0.5; Ceiling 0.8	12–16	10	B1-1 to B1-29 (and separate arms rooms coupled to the types 10, 10a and 11
C	Exterior 0.6; Interior 0.3; Ceiling 0.5	6	6–7	C-1 to C-8
D	0.3	5	2–5	D-1 to D-5

capable of firing 30–120 rounds per minute in a range of 20–600m. Additionally a flamethrower was installed that again was specially designed for use in a fortress. It could fire through 360 degrees in a range of 40–50m. The fuel was stored safely in the bunker and there was sufficient to fire 20 bursts of 90 seconds. A small armoured cloche was fitted to provide all round observation. The facility was also fitted with a machine room which housed the generator, kitchen, first aid room, stand-to area, storeroom, well, washroom and toilets.

Other standard structures of Type B and B1 strength were constructed. These tended to be built on single level. Although there were numerous designs, the Type B bunkers contained many common features. The entrance was at the rear and was covered by a machine gun; an overhanging diagonal lip protected both from artillery and mortar fire. The door leading into the shelter was constructed from steel and was gastight. Inside, the entrance was covered by an aperture set in the rear of the combat room. This room also housed the main weaponry, a water-cooled MG08. The machine gun was mounted on a carriage that allowed it to be removed from the loophole, which could then be sealed with an armoured plate. A stand-to area was provided which served as the crew's sleeping quarters and where they would eat. The room was also fitted with an emergency exit. Some of the positions were fitted with a three- or six-embrasure cupola; others included a garage with armoured doors to house a 37mm PaK 35/36 which could be wheeled out if required for use.

The Type C was derived from the Type B1 but had thinner walls and armour and as such was less able to withstand bombardment from larger calibre weapons. Finally the Type D was the simplest, cheapest and weakest of the defences. This was only capable of withstanding small-arms fire and was not designed for long-term



An MG08 similar to those installed in bunkers of the Oder-Warthe-Bogen. The base plate on which the machine gun was mounted is clearly visible. This enabled the gun to be retracted and the aperture closed. This example is now on display at Festung Königstein, near Dresden.





LEFT
To insulate the lower structure from damage when the main fighting positions were attacked, a buffer was constructed. This ensured that any shocks resulting from bombs or shells hitting the bunker above ground were not transmitted to the underground tunnels.

RIGHT
Interior section of a tunnel showing brackets for cables. Also visible are smaller openings in the wall for explosives. If the enemy entered the tunnel, these would have been detonated to seal off the incursion. In this section of tunnel the walls were thinner so as to ensure that the tunnel would collapse.

occupation with no ventilation, or sleeping facilities. Weapons could be easily removed and used outside. In August 1938 the Type D was discontinued, because it was considered too weak.

Werkgruppe

The *B Werke* and other defences were often joined together with tunnels in so-called *Werkgruppe* or *Festungsgruppen*. These groups were in turn linked to other groups and the rear by further tunnels. The logic for this was simple in that it allowed the movement of men and materiel without being seen by the enemy and, more importantly, without being exposed to enemy fire. These tunnels varied in size with the largest capable of taking a narrow-gauge railway, which served to transport troops, ammunition and supplies to the fighting positions. In cross section the tunnels were all oviform (egg-shaped) as this shape was best suited to coping with the external pressure of earth and rock. The bottom of the tunnel was flattened and where necessary the tracks for the underground train were set in the concrete.

The tunnels of the OWB stretched over 30km and were some 20–40m below ground. Breathers, effectively large chimneys, were provided which ensured that air circulated. The main entrances were located some 2km to the rear and were protected by gates and machine-gun loopholes. Elsewhere within the tunnel system similar security was provided in order to prevent the enemy from entering the underground system after capturing one of the *Panzerwerke*. It was also possible to dynamite sections of tunnel to block access.

As well as the extensive tunnel system, subterranean galleries were provided. These served a number of purposes including accommodation for the garrison, kitchen, washrooms, hospital, munitions and general stores and generator room. The subterranean galleries and tunnels were linked to the fighting positions by stairs constructed from concrete or steel, with lifts for the movement of ammunition.

Water defences

The lakes and rivers along Germany's eastern border were ideally suited to the creation of a defensive line. Weirs and dams were constructed with sluices which enabled the defenders to control the flow of water and inundate vast areas when the threat of invasion was imminent. Bridges across the





watercourses were prepared for demolition. Where new bridges were installed these were specially designed to ensure that they could not be captured by the enemy. Some were swing bridges (*Drehbrücke*) that could be turned through 90 degrees while others were retractable bridges (*Kipprollbrücke*); the main load-bearing section of the bridge could be retracted using a motor housed on the near bank. Some of the machinery rooms had a loophole to allow the defenders to lay down suppressing fire.

LEFT
Side view of the rotating bridge at Kurzig (Kursko). The small concrete structure shown middle bottom provided access to the main mechanism for rotating the bridge. The bridge would rotate 90 degrees, making it impossible for the enemy to cross.

RIGHT
Dragon's teeth near Panzerwerk 716 which formed part of the Oder-Warthe-Bogen. These were constructed in four rows with the smallest at the front and the largest at the rear. Only the middle two rows can be seen here.

Passive defences

Where natural obstacles could not be used to block armour, dragon's teeth, or *Höckerhindernisse*, were erected. These were reinforced-concrete pyramids that were poured in four rows with the smallest teeth (0.4m) at the front and the largest (1.0m) at the back. Roads through the anti-tank defences were blocked with either gates, or simple *Trägersperre* – concrete structures built either side of the road with recesses that could accommodate 12in. steel 'H' beams. In the later stages of the war it was no longer feasible to install dragon's teeth or even pile wooden stakes into the ground (*Pfahlhindernis*) so tank traps (*Panzergraben*) were dug by armies of men, women and children.

Tobruk pit

Experience from the early campaigns of the war, particularly the fighting for the Maginot Line, had shown that armoured cloches like those used in the OWB were vulnerable to direct fire. Moreover, such cloches were expensive to build and used valuable raw materials that could be better used in the production of other weapons. One alternative was the *Ringstand*, or Tobruk (so named because of the similarities to the Italian concrete shelter encountered by British forces in Tobruk). These observation posts had been integrated into larger bunkers in the Atlantic Wall, but in the east were constructed as individual positions. Essentially it was a concrete shelter that was set into the ground so that the circular opening in the top was level with the ground. An entrance at the rear led to a trench which allowed safe, easy access. Some of these positions were mounted with captured or obsolete German turrets which protected the crew and provided additional firepower, though the guns were not capable of piercing the armour of the new Russian tanks.

BELOW
A Tobruk pit (Regelbau 58c) near Panzerwerk 717. The round opening in the top is clearly visible, which is where the crew would be able to observe and engage the enemy. The structure was built in 1944 as part of efforts to reinforce the Oder-Warthe-Bogen.





A set of working points in the tunnels of the Oder-Warthe-Bogen that were used to control the movement of the small diesel trains on the narrow-gauge network. The tracks are visible to either side. The cover was manufactured by the Bochumer Verein Werk, Weitmar.

Koch pots

One of the last defences developed by the Germans was the Koch bunker or pot. This was supposedly designed by, and named after, the Gauleiter of East Prussia and produced by a close colleague who owned a concrete works – a cosy relationship that encouraged rumours of nepotism. The idea was very simple. A prefabricated concrete tube was buried vertically so that its top was flush with the ground. It was large enough to accommodate one soldier armed with a Panzerfaust, or small arm, and was designed to protect them from shrapnel and small-arms fire. However, the Koch bunker was disliked. The shelter left the individual feeling isolated and the concrete was of poor quality and tended to splinter when hit.

THE LIVING SITE

From the time that construction began to the end of World War II numerous groups were involved in building and manning the German eastern defences.

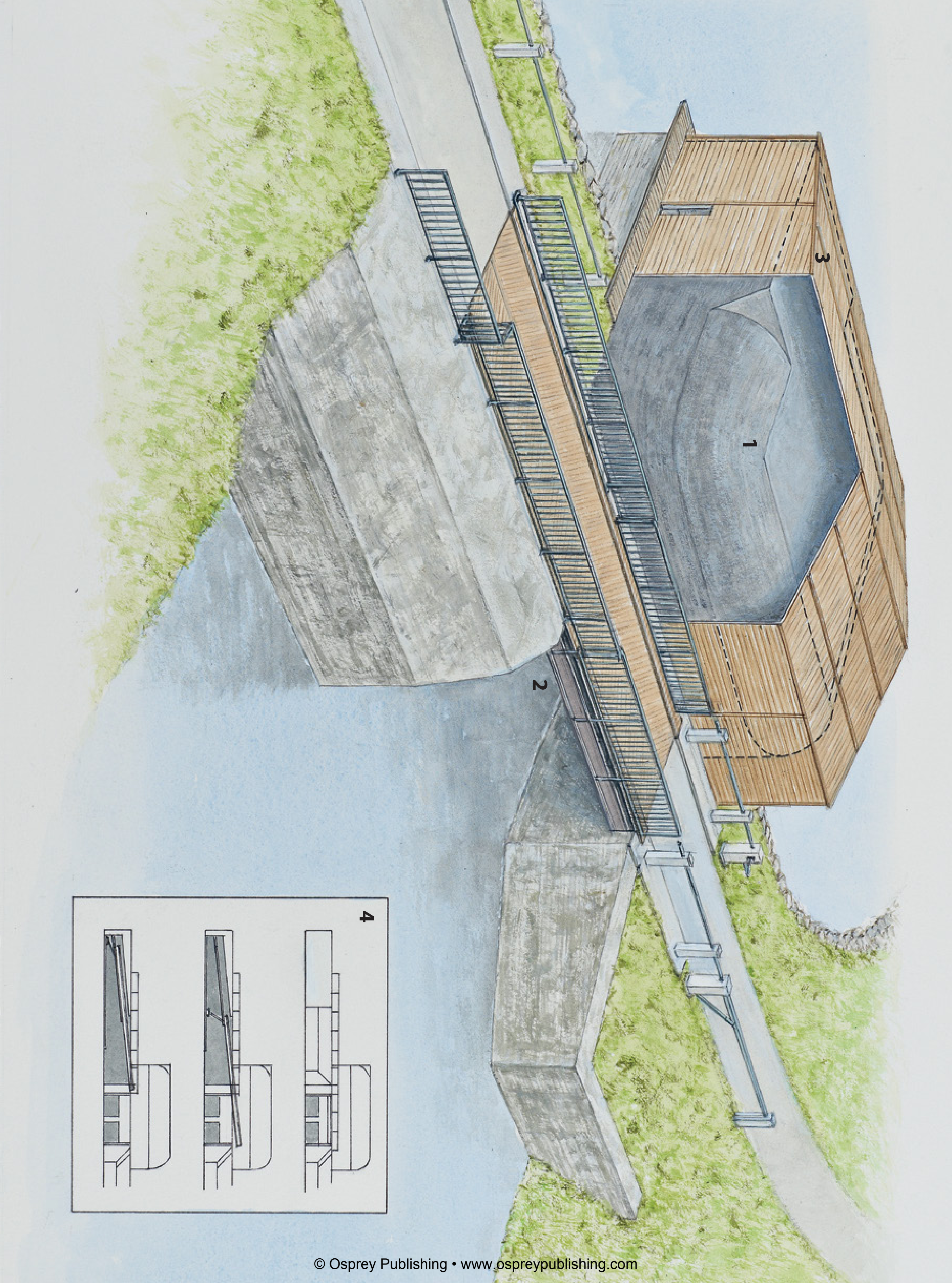
Pre-war

Pioniere

Under the terms of the peace agreed at Paris, severe limitations were placed on the German armed forces. One restriction was the dissolution of the General Staff. To circumvent this, General Hans von Seeckt, Commander of the Army, established the Truppenamt, which was the General Staff in all but name. In addition, Seeckt established a Weapons Office which included the Waffenamt Prüfwesen 5 (Pioniere) (Wa Prüf 5) – (Weapons Testing Department). Separately, Seeckt also created a series of inspectorates, including Inspektion der Pioniere und Festungen 5 (In. 5) (Inspectorate of Engineers and Fortifications). These organisations combined were responsible for developing fortification plans and designs. However, the job of reconnoitring sites and recommending where the defences should be built was the responsibility of the Stabsoffizier der Pioniere (Engineer Staff Officer) who worked in one of the three *Wehrkreiskommandos* (Military District Headquarters) on the eastern border (Wehrkreis I – Königsberg, Wehrkreis II

C **WATER SLUICE AND RETRACTABLE BRIDGE**

When work on the eastern defences began, engineers, lacking the resources to construct elaborate fortifications, used the natural features between Lake Nischlitz and the River Obra to strengthen the line. Sluices, dams and bridges were built under the pretence of 'water management' work. Wasserschloss (water sluice) 602 **(1)** and Kipprollbrücke (retractable bridge, **2**) were constructed at the south-eastern corner of Lake Nischlitz. The sluice was protected by a concrete bunker in strength Type A **(3)**. This massively strong structure was additionally camouflaged as a barn. The sluice regulated the water level of the lake. Using planks lowered into place with pulleys it was possible to create a dam some 2m in height meaning large areas around the position were inundated. The retractable bridge was adjacent to the bunker and using machinery on the near bank, the bridge could be rolled back, as shown in the inset diagram **(4)**, thus making it impossible for the enemy to cross.


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LEFT
In amongst the other graffiti it is easy to miss little details like this chalk 'sign off' – a simple 15/5 (being the date) and the initials of the overseer who had approved the work.

RIGHT
In addition to the chalk sign-off marks that are etched on the tunnel walls by the overseer of the work, there are pieces of original graffiti. This *Jäger* (hunter) with distinctive hat is seen on a number of occasions.

– Stettin and Wehrkreis III – Berlin). The Engineer Staff Officer was in turn supported by officers in fortification command offices.

Following the accession to power of the Nazis the scale and scope of the defences grew enormously. To oversee the work, in 1934, the Army (Oberkommando des Heeres) created the Inspektion der Ostbefestigungen (Inspectorate of Eastern Fortifications) which was responsible for all defences in the east (a similar organisation – Inspektion der Westbefestigungen – was created to oversee the construction of the defences in the west). This organisation was in turn split into a series of regional bodies or *Festungsinspektionen* (Fest. Insp.) or Fortress Inspectorates (see Table 2). These inspectorates were in turn sub-divided into *Festungs Pionier Stäbe* (Fest.Pi. Stb.), or Fortress Engineer Staffs. They oversaw the construction work which at the outset was mostly undertaken by civilian contractors. In East Prussia alone 40 construction companies were employed in building fortifications.

Table 2: Inspektion der Ostbefestigungen (Inspectorate of Eastern Fortifications)

Name	Location	Responsibility	Sub-units
Fest.Insp. I	Königsberg	Responsible for East Prussia.	Under this were four Fortress Engineer Staffs (Fest. Pi. Stb.) 1, 2, 3 and 25.
Fest. Insp. II	Deutsch Krone	Responsible for the Pommern Stellung.	Under this were two Fortress Engineer Staffs (Fest. Pi. Stb.) 4 and 5.
Fest. Insp. III	Küstrin	Responsible for the Oder-Warthe-Bogen fortified front.	Under this were two Fortress Engineer Staffs (Fest. Pi. Stb.) 6 and 7.
Fest. Insp. IV	Glogau	Responsible for the Oder Stellung.	Under this were three Fortress Engineer Staffs (Fest. Pi. Stb.) 8, 9 and 16.
Fest. Insp. XI	Vienna		

Border guards

In the aftermath of World War I, the challenge of defending Germany's eastern border was made doubly difficult by the terms of the Paris Peace Agreement. Firstly, the establishment of the Polish Corridor meant that East Prussia was now separated from greater Germany. Secondly, Germany could only maintain

an army of 100,000 men. To address this problem, while complying with the terms of the peace deal, a Border Protection Force was established. (This force had its origin in the Grenschutz Ost, or Border Defence East, which was established in 1919 and was designed to counter the threat from Polish forces; the force was mainly manned and officered by the Stahlhelm – Germany's largest veteran's organisation.) The Border Force consisted of older volunteers (35–45 years of age), many of whom would have served in World War I. They were organised like the regular army with infantry regiments (*Grenz Infanterie*) supported by a light artillery detachment. By the middle of the 1930s the Border Protection Force was some 40,000 strong (see Table 3).

Table 3: Eastern Border Protection 1939 (source: Kaufmann)
Pomerania
Neustettin
Frontier Guard: 2 battalion staffs and 18 companies with 27 AT guns, plus 6 MG companies
Deutsch Krone
Frontier Guard: 4 battalion staffs and 22 companies with 17 AT guns, plus 17 MG companies
Oder-Warthe-Bogen Fortified Front
Küstrin Border Command: 121st, 122nd and 123rd Border Infantry regiments supported by 101st, 102nd and 103rd Border Artillery Battalions.
Frontier Guard: 3 battalion staffs and 10 companies with 16 AT guns
Silesia (and Oder Line)
13th Border Command: Landwehr AT company
14th Border Command: 183rd Landwehr Infantry Regiment
Glogau
Frontier Guard: 2 battalion staffs and 12 companies with 10 AT guns, plus 15 MG companies
Breslau
Frontier Guard: 2 battalion staffs and 9 companies with 10 AT guns, plus 6 MG companies
Oppeln
Frontier Guard: 3 battalion staffs and 25 companies with 24 AT guns
East Prussia
Königsberg
Frontier Guard: 2 battalion staffs and 21 companies with 16 AT guns
Fortress Garrison: 152nd and 153rd Landwehr Artillery and 131st Landwehr Engineer Battalion
Lötzen
Frontier Guard: 1 battalion staff and 8 companies with 10 AT guns
Fortress Garrison: 161st Landwehr Engineer Regiment
15th Border Command: 4 battalion staffs and 40 companies with 38 AT guns

On paper then, the Border Protection Force on the eve of World War II looked impressive. 'Manstein, however, was not complimentary about their military value in the event of a foreign invasion' (Melvin 2011, p.53). As it happened their fighting strength was never tested and eventually elements of the Küstrin Border Command (121, 122 and 123 regiments) were combined and formed the 50th Infantry Division. The division was involved in the invasion of Poland and France before returning to the Eastern Front where it took part in the invasion of the Soviet Union. It was eventually destroyed in East Prussia at the end of the war.

To support the Border Guards were units of the Landwehr. As part of his remilitarisation plans, Hitler had re-established this militia, which was made up of men liable for military service in the age range 35 to 45 years. During the war the Landwehr, or Landesschützen Bataillone (local defence battalions) as they were later known, were used for guard duties.


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3

Interregnum

By the end of 1941, the defences in eastern Germany and in East Prussia were far behind the front. All able-bodied men were either fighting, or employed on vital war work, leaving only low-grade workers to maintain the defences. Even then there proved to be insufficient men, and foreign labourers had to be employed. The situation became even more acute following the decision in 1942 to start work on the Atlantic Wall. This not only required manpower, but additionally the fortifications needed fitting out and soon workers were removing equipment and weapons from the eastern defences for use on the coast. At much the same time the intensity of British (and later American) bombing raids on Germany grew with war industries one of the key targets. To maintain output levels it was imperative to protect production facilities and the idea of using the tunnels in the Oder-Warthe-Bogen was suggested. In 1943 Daimler relocated there to produce aero engines. Workers were sent to both widen the tunnels to make them suitable for this task and increasingly to undertake war work. They were housed in labour camps to the north of Hochwalde (Wysoka) and another near Burschen (Boryszyn).

Wartime

Organisation Todt/RAD

The Organisation Todt (OT) was a paramilitary organisation that was uniquely named after a member of the Nazi Party elite – Fritz Todt – who was an engineer and architect, much admired by Hitler. In the years before the war the Organisation Todt's primary role was the construction of the new German road network – the *Autobahnen*. However, in 1938 Todt was given the task of completing the western defences – the so-called West Wall. In this task Todt was able to draw on the pool of labour that had been created following the establishment of the Reich Labour Service (Reichsarbeitsdienst, RAD). The Reichsarbeitsdienst was created by the Nazis to help mitigate the effects of mass unemployment on the German economy, militarise the workforce and indoctrinate it with Nazi ideology. From June 1935 onwards, all able-bodied men aged between 18 and 24 had to serve six months with the RAD before their military service. Throughout the course of the war, the RAD was involved in many projects supporting the Wehrmacht including repairing roads, building airstrips and constructing fortifications. RAD personnel also performed combat roles, manning fortifications and Flak



KOCH BUNKER

By October 1944 the Red Army was at the East Prussian border and urgent action was needed to protect the homeland. However, the Germans had neither the time nor the resources to construct permanent defences. Instead, they relied on field works, often reinforced with concrete. One of the best-known examples was the Tobruk concrete shelter which was used on all fronts. However, as the retreating Germans became increasingly desperate, even this simple defence was impractical and an even simpler design was developed, supposedly the inspiration of the Gauleiter of East Prussia, Erich Koch – hence the name.

The 'bunker', in reality little more than a concrete tube, was buried in the ground and provided effective protection for the occupant from small-arms fire and shrapnel. The tube was 1.6m high and 1.4m in diameter with walls 0.1m thick. There were two different openings; one which had a lid that was 0.2m thick with a 7–8cm opening for a periscope or radio antenna **(1)**; and one with an opening 0.8m across **(2)**. The wider opening enabled the crew to use a machine gun or Panzerschreck/Panzerfaust.

The bunker was very adaptable. The concrete tube could be buried in the ground on its own, or could be linked to other Koch bunkers buried vertically or horizontally. A 0.75m opening in the side of the bunker **(3)** enabled the crew to access the shelter or link with other Koch bunkers; official drawings show as many as five bunkers linked together.



positions and guarding vital locations. Several RAD units also served on the Eastern Front as infantry.

Following the outbreak of war the scale and breadth of work undertaken by the OT grew. This necessitated a huge increase in labour which was initially met by German workers as the laws on compulsory service were extended, but the demands of the Russian campaign (and the construction of the Atlantic Wall from 1942) meant that increasingly manpower came from the occupied territories. Some men volunteered to work and others were forced, as were prisoners of war. One of the principal tasks assigned to the OT was the construction of the Panther and Wotan defensive lines. In this endeavour four Construction Groups (Ausbaugruppe I–IV) were established. Each of these was linked to an army (so for example Ausbaugruppe III supported the German Fourth Army) and consisted of 10 to 15 sections or divisions whose job it was to prepare the defences.

The *Bereitschaftsraum* (stand-to area) in Panzerwerk 717, where the garrison could rest. To the left are gas masks and rifles in the rack. Between this and the three collapsible beds is a *Sprachrohr* (speaking tube) that was used to communicate in the bunker.

Civilian labour (levée en masse)

In July 1944 Stalin launched his summer offensive – Operation *Bagration* – which for the first time saw German territory threatened. Erich Koch, Gauleiter of East Prussia, persuaded Hitler to begin work on new eastern defences to protect the *Heimat* (homeland). With men of fighting age at the front, women and men (young, old and infirm) who had not been called up were conscripted to do the work. In East Prussia some 200,000 workers, half of them foreign labourers, were set to work on the defences. In Upper Silesia at the end of July 1944, men and women were instructed to register at labour offices ready to undertake work to protect the borders of the Reich. Some 100,000 people, including 30,000 foreign workers, were conscripted to construct the so-called Barthold defences to defend Silesia.

A section of tunnel wall in the Oder-Warthe-Bogen showing the cable brackets. Also of note are the red arrow and the number '2'. During the war Daimler used the tunnels for war work and this mark denotes the position of a machine.



On 1 September 1944 Hitler formalised this arrangement with his 'Instruction to the Party Chancellery 12/44' which stated: 'The Gauleiters are responsible for taking all measures to ensure that construction works on defensive positions are implemented as soon as possible.' The *Gauleiter* (regional leaders) in their capacity as *Reichsverteidigungskommissare* (RVKs) or Reich Defence Commissars, organised the work. *Kreisleiter* (county leaders) were to employ supervisory staff to oversee work, and these local party officials, supported by the likes of the Hitler Youth, ensured the work was completed. Foreign workers and POWs were segregated and overseen by guards. The police were used to enforce discipline.

Although the military situation was dire, those undertaking important war work – armaments workers, Reichsbahn (rail) employees and the police – were exempt, as were party and state officials. Others delivering important services (butchers, bakers and dairy workers) were also excluded from the levée.

In spite of these exemptions, businesses still had to close and services were reduced. Significantly, the harvest was also affected as farm labourers were set to work on the defences. Medical exemptions from this work were only granted in exceptional circumstances and were at the gift of party officials. Those who tried to avoid the draft, if caught, were subject to punishments under martial law.

And not only did the Nazi Party want the people's time and effort, the workers had to bring their own tools and a weapon if they had it, as well as provisions, cooking utensils and a tent. Transport would be provided, unless they lived in the immediate locality. The workers were paid, but many were said to have refused the money. They also received a decoration, the Schutzwall Ehrenzeichen (German Defence Medal), for their efforts.

At the outset the levée en masse 'appeared initially to boost morale, the measure diverting attention away from worries about the Soviet advance and instilling a sense of real public participation in total mobilisation' (Noble 2010, p.101). However, this optimism soon ebbed, especially when people were sent home to get warm clothing. The weather deteriorated and made working conditions difficult, if not dangerous, before it was finally suspended in the winter when the ground was frozen. Gradually workers were sent home unable to work, others because they were no longer capable. Many people were unused to hard physical labour and these exertions exacerbated underlying conditions, or, with the poor sanitary conditions, led to the outbreak of disease. Workers, both domestic and foreign, were also increasingly badly treated. Party officials overseeing the work criticised the efforts of the conscripts, yet at the same time did little work themselves, drank to excess and ate well, often taking food meant for workers. Foreign workers who were directed to work on the defences were, paradoxically, often committed to the task fearing life under Stalin, but poor treatment alienated them and many absconded or did little work when on site. The whole situation is summed up in one paragraph from Hargreaves (2011, p.25):

> Makeshift camps … sprang up across Silesia to accommodate the influx of diggers. Workers found themselves living in tents, in empty factories, barns, in outhouses, in school buildings. Facilities were rudimentary. Pits were dug on the edge of town to serve as 'toilets' … but the smell was so overpowering, many did not have the stomach for using them. Food came courtesy of field kitchens, invariably soup or some form of broth, which was often so weak that the diggers poured it back into the vat in disgust. Life was rather better for the Party Leaders (better food and accommodation and alcohol) … they drove their workforce ruthlessly and relentlessly.

A *Kampfraum*, or fighting compartment, of Panzerwerk 717 covering the main entrance. The MG08 machine gun is mounted on its original stand. The observation slit and loophole are both fitted with sliding armoured plates which were used when the weapon was not in use.



Fortress troops

As the Wehrmacht was pressed back towards Germany proper, consideration was given to the identification and training of fortress troops who would man the pre-war defences and those that had been newly constructed. These fortress troops would not come from the regular army but would be men who had not yet been conscripted. They would be specially trained to fight in defensive positions and would in the first instance be sent to the Eastern Front. Initially Guderian established 100 battalions of fortress infantry, but the


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need for manpower was so desperate that they tended to be used as 'fire-fighting' units, sent to plug gaps in the line, even though it was obvious they were ill-suited to this type of fluid warfare. Thus the problem of manning the border defences remained and as Guderian concluded, 'the handsome fortifications and strong-points remained ungarrisoned' (Duffy 1991, p.374).

The permanent fortifications were not the only ones to be deprived. With the fortress troops already committed, the *Festungen* or fortresses that Hitler had established were manned by a mishmash of units. In Küstrin, 'The fortress garrison eventually comprised members of all arms of the army and Waffen-SS mixed with Flak, police and gendarmerie units. By the end of February [1945] it had reached its maximum ration strength of about 16,800, of which only about 10,000 were actually combatants [including two fortress regiments]. These numbers included 900 Volkssturm [made up of two battalions – one from Küstrin and one from Luneburg]' (Le Tissier 2008, p.84).

Volkssturm

By September 1944 the Allies were pressing on Germany's eastern and western borders. Desperate circumstances called for desperate measures and the idea of creating a home guard was floated. However, in the culture of mistrust that existed in the period after the 20 July plot, the idea of creating such a force and placing it under the army's control was not acceptable. Instead, the Volkssturm, or people's militia, was created and placed under the control of the party (Directive 278/44 issued by the Party Chancellery on 27 September 1944 – see Table 4). The plan was to create a force of 6 million men by conscripting males in the age range 16 to 60 who were capable of bearing arms and who were not already serving in some military unit, or engaged in vital war work.

Each *Gauleiter* was charged with the leadership, enrolment, and organisation of the Volkssturm in their district. *Gauleiter* and their deputies, the *Kreisleiter*, were also responsible for selecting officers. Initially they tended to select party men, but later the emphasis changed and officers were selected on the basis of military experience. Himmler, as commander of the Replacement Army, was responsible for training and arming the Volkssturm. Training was necessarily brief because of a lack of instructors and the perilous situation of the war, with only a brief introduction to firing a rifle and Panzerfaust. Weaponry was similarly limited. The Volkssturm were issued



GESCHÜTZSTELLUNG WITH 75MM KWK51 L/24

As the situation on the Eastern Front became increasingly desperate, the German high command considered utilising all the weapons at its disposal. Already tank turrets had been mounted on concrete, steel and wooden shelters. Now in 1944 and 1945 obsolete weapons from old tanks and armoured cars were fitted to makeshift mountings to act as improvised anti-tank guns. The 75mm KwK 51 L/24 had previously been mounted on early Panzer IV tanks and Stug III assault guns and later the SdKfz 234/3 (armoured car), 250/8 (half-track) and 251/9 (half-track). In the winter of 1944 stockpiles of the weapon were released for use at the front. The barrel was short and had a low muzzle velocity and as such was of limited use against the new, thicker enemy armour. Nevertheless, a significant number were employed in the east. In the defence of Frankfurt an der Oder 24 such weapons were deployed. A number were later recovered and one is on display at Fortress Königstein, near Dresden.

The weapon was emplaced in a simple dugout (**1**) with the spoil built up in a U-shaped ramp around the position to provide added protection. To the rear of the dugout were steps leading to a trench. The 75mm KwK 51 L/24 gun was fitted with an armoured shield to protect the crew from small-arms fire. The position also featured a shelter for the crew (**2**) and another shelter for the weapon's ammunition (**3**) capable of storing 60–70 rounds. The weapons located near Frankfurt were manned by ten men – one sergeant and nine crew – and were part of the Fortress PaK Group 26; the Volkssturm shown here are armed with a mixture of rifles, sub-machine guns and Panzerfaust.

with whatever weapons were available; some were older models and others were from Belgium, France, Italy and the Soviet Union which had been captured by German forces during the war. Others had no weapons at all and were only armed when they reached the front.

The primary task of the Volkssturm was to support the Wehrmacht. Thus, if the German border was threatened and regular units could not cope then Volkssturm units could be deployed to meet the threat. Their deployment was to be temporary until regular units were able to be moved to meet the incursion. In combing through the available manpower, men were allocated to different groups depending on whether their work was vital to the war effort. Those in the first and second levy were available to fight. However, while the battalions in the first levy could be used anywhere in the *Gaue* (regions), battalions from the second levy could only be deployed in an absolute emergency and only in their immediate locality, because their work was deemed of critical importance to the war effort. In fortress cities regular units would form the skeleton of a larger unit which would be filled by men from the Volkssturm when the city was under threat. The Volkssturm personnel would work as normal and would train in the evening and at weekends and would only mobilise when the threat of any enemy attack was imminent.

The decree signed by Hitler ordering the creation of the Volkssturm was sent to *Gauleiter* at the end of September and this was not a moment too soon. On 10 October Gauleiter Koch ordered the first battalions to man the defences, and as early as 20 October seven battalions were fighting in East Prussia. They acquitted themselves well and helped repel the Soviet attack. From the middle of December 1944 15 battalions of the Volkssturm manned the Pommern Stellung (and Festung Schneidemühl) fortifications. 'The men were deployed for a 14 day period and received military training. Winter clothing was also provided on site but was returned at the end of the deployment period and passed on to the next batch of men' (Noble 2010, p.159). Men of the Volkssturm and 433rd and 463rd Reserve Infantry divisions of Wehrkreis (Military District) III were deployed along the Oder-Warthe-Bogen position. But these regular troops and militia men were not familiar with, nor trained to man, the permanent defences. Thus, 'For sophisticated defences such as those of the Oder-Warthe-Bogen fortified front there was insufficient technical support and a lack of … troops with specialised training to operate the defensive installations' (Noble 2010, p.212). General Werner Kienitz of Wehrkreis II concluded: 'the thought that a poorly armed mass levy of old men and boys would turn around the fate of Germany in the struggle against massed Soviet tank armies was totally unprofessional not to say criminal. This material was unsuitable' (Noble 2010, p.159).

Table 4: Directive 278/44 issued by the Party Chancellery on 27 September 1944

Re: Maintenance and security of defensive positions
As ordered by the Führer, I hereby charge the *Gauleiter* responsible for the construction of defensive positions with the following responsibilities:
1. The maintenance and security of the positions constructed by them and not yet occupied by our troops including all material stored within them and built into them.
2. The formation of security garrison which on the approach of the enemy shall defend the positions until a planned defence can be organised by the armed forces.
The necessary measures are to be taken in agreement with the responsible Deputy General Commander, the security garrisons are to be set up within the framework of the Volkssturm.
Signed: M Bormann

OPERATIONAL HISTORY

The defences of the Oder-Warthe-Bogen and Pommern Stellung had been constructed to protect Germany from a Polish attack, but by 1939 the German armed forces were far superior to those of their neighbour and on 1 September Hitler invaded Poland. In a few short weeks Germany was victorious and now defences were constructed along the new border. Hitler's latest act of aggression had precipitated a European war and in May 1940 he sent his armies west to defeat France and Britain. Within six weeks France had surrendered and British forces had been evacuated from the Continent. Plans were drawn up for an amphibious operation to eliminate this last bastion of democracy, but the invasion plans were shelved and Hitler looked east once again. In June 1941 he invaded the Soviet Union intoning, 'You only have to kick in the door and the whole rotten structure will come crashing down.' At the outset his prediction seemed correct with German forces advancing everywhere. Soon the Wehrmacht was approaching Leningrad and the Soviet capital, Moscow, and the eastern defences, far behind the front, were largely abandoned.

In 1942 the German offensive was resumed and initially it was successful, but in the winter of 1942/43 Hitler's forces suffered their first major defeat at Stalingrad. The balance of power was slowly shifting and the German high command now looked to consolidate their gains. The preferred solution was to construct a defensive line and in August 1943 work began on the 'East Wall' or 'Eastern Rampart' which, it was hoped, would halt any Soviet attack. However, the growing strength of the Red Army and the frailty of the defences was already apparent and in an effort to avoid a propaganda coup for the enemy, the defences were renamed the Panther and Wotan lines. This change came not a moment too soon, because by September 1943 the defences in the south were already under threat.

When Stalin launched his summer Soviet offensive, Hitler ordered Army Group South to withdraw behind the Dnepr and to take up positions in the Panther Line. The logic for this withdrawal was impeccable, if a little late, but the plan was fatally flawed. Firstly, as the German troops fell back across the river to take up positions in the 'East Wall', they found to their dismay that no substantial defences existed. Secondly, there were only five crossing points across the Dnepr: Kiev, Kanev, Cherkassy, Kremenchug and Dnepropetrovsk. German forces funnelled back towards these crossing points, leaving the rest of the river unprotected. Realising the opportunity, Soviet troops were ordered to use any means available to cross the river and soon two large bridgeheads had been established. By the middle of December, Army Group South held only an 80km stretch of the Wotan Line between Kiev and Cherkassy.

The situation was little better for Army Group Centre, and in particular where its flank joined that of Army Group South. In the middle of October, Konstantin Rokossovsky's Central Front launched an attack in the region of Loyev, near the



A Panzernest that was used extensively on the Eastern Front. It was designed to be buried in the ground so that just the front aperture could be seen. It could accommodate a crew of two and their machine gun. This example is on display at the Stalin Line Museum near Minsk.

confluence of the Sohz and Dnepr rivers seizing a bridgehead over the Dnepr. Rokossovsky reinforced this position and in mid-November he broke out, smashing a hole 80km wide in the Panther position.

While the 'East Wall' in the areas of Army Group South and Centre had been broken, in the north, Soviet forces had yet to reach this defensive line. Not until 1 March 1944 did Army Group North complete its withdrawal to the Panther position. The Soviets recognised the danger of allowing the German troops to settle into their prepared positions and, although exhausted and having failed to fully reconnoitre the enemy positions, launched a series of attacks in March and April. The defences held and soon the spring thaw brought an end to operations in the region; in two months it is estimated that the Soviets suffered some 200,000 casualties. Not until the summer was the attack resumed. In July, the Red Army launched the second phase of its summer offensive (*Bagration*). Andrey Yeremenko's 2nd Baltic Front advanced against units of Sixteenth Army ensconced in their Panther Line positions (in fact it was not a single line but a series of defensive lines including the Reiter, Blue, Green and Brown lines). On this occasion he was successful. 'Within little more than forty-eight hours [of 10 July] Yeremenko's assault armies ripped out a gap fifty miles [80km] wide and more than ten deep in the German defences' (Erickson 2008, p.313).

The Baltic States and East Prussia itself were now threatened. In October General I. D. Chernyakovsky's 3rd Belorussian Front made an attempt to smash its way into East Prussia, but was unsuccessful. 'German resistance was fierce, and German fortified lines were so formidable that it took four days for Chernyakovsky to penetrate the tactical defences. The second defence line, along the German border, was so strong that Chernyakovsky committed his tank corps to overcome it. Together, on 20 October 11th Guards Army and 2nd Guards Tank Corps finally ruptured the defence and approached the outskirts of Gumbinnen' (Glantz, 2015). But German counterattacks pressed the Soviets back and eventually the advance was halted. 'Soviet forces had advanced from 50–100 kilometres into East Prussia and learned from experience what extensive preparations would be required in the future to conquer Germany's East Prussian bastion' (Glantz, 2015). The German propaganda machine went into overdrive. Early newspaper reports talked of the Soviets having to use 'a stupendous mass of forces, comprising innumerable rifle divisions and a series of tank corps' to attack East Prussia, but that they had 'been checked by our newly created protecting positions' (Noble 2010, p.289). A German newspaper report written in November 1944 explained how, 'These deep defences had proved invaluable in halting a materially stronger foe' (Noble 2010, p.290). For once the German propaganda contained a kernel of truth. The Soviets withdrew and reorganised ready for the next offensive.

In the autumn of 1944, with the front seemingly stabilised in the east, Hitler turned his attention to the Western Front. In September the Allies had reached the West Wall and proceeded to fight their way through the defences. The Western Allies were now close to capturing the first major German city, Aachen, but more significantly were uncomfortably close to the heart of German industry in the Ruhr. Hitler was determined to act and amassed an army of 1 million men to deliver a powerful counter-thrust in the Ardennes that would split the Allied armies in two and drive them back to the sea. The plan was greeted with dismay by the army, none more so than Guderian who had been made Chief of Staff of

the Army (Chef des Generalstab des Heeres) after the July plot. He now commanded German forces on the Eastern Front and was desperately trying to hold a 2,000km front with too few troops. Guderian met with Hitler on Christmas Eve 1944 and explained as forcefully as he dare that intelligence suggested that in the New Year the Soviets would launch a massive offensive against Germany. Hitler dismissed the reports out of hand and although it was clear that the Ardennes offensive had failed, he refused to countenance the release of units to the Vistula and instead ordered troops to be sent to Hungary. Guderian attempted to convince Hitler on a number of further occasions but was met with the same intransigence. He returned to Army HQ at Zossen near Berlin to await the inevitable onslaught, which was not long in coming.

1945

East Prussia

On 13 January 1945 General Chernyakovsky's 3rd Belorussian Front once again advanced into East Prussia. His strategy was reminiscent of the opening battles of World War I with Fifth Army, flanked by the Thirty-Ninth and Twenty-Eighth armies, advancing north of the Masurian Lakes. Initially it seemed his forces would suffer the same fate as the Russians in the Battle of Tannenberg 30 years previously. Recognising that an attack was imminent Generaloberst Raus, commander of Third Panzer Army, had withdrawn his forces to avoid being caught in the Soviet preliminary bombardment. When this had subsided the German troops slipped back into their defensive positions. Expecting little resistance, the Soviets advanced, but were met by a determined force which was well dug in and which proceeded to launch a series of counterattacks that served to stymie Fifth Army's assault.

The delay to Chernyakovsky's advance prompted Stavka (the Soviet high command) to order Rokossovsky, commander of 2nd Belorussian Front, to change the focus of his advance. On 20 January the 2nd Belorussian Front began to advance north-eastwards and having fought its way through the defences of the Hohenstein Stellung and Ortelsburger Waldstellung the 3rd Guards Cavalry Corps entered Allenstein two days later. Meantime Fifth Guards Tank Army advanced on Elbing and, bypassing the city, reached the Frisches Haff on the Baltic – East Prussia was now cut off from the rest of the Third Reich. Fearing encirclement and annihilation, 'The trapped 4th German Army, to Hitler's fury, abandoned the heavily fortified defences of Lötzen amid the Masurian lakes and tried to break out to the west' (Kershaw 2011, p.173).

To the east, the fortunes of Chernyakovsky had improved. On Fifth Army's right flank, the Thirty-Ninth Army had made better progress and now the Eleventh Guards Army was deployed to exploit the success; by 24 January Chernyakovsky was within striking distance of Königsberg. The defenders who had benefited from the hastily constructed defences in October now found them more of a hindrance than a help. Hauptmann Alfred Jaedtke, commander of an armoured battlegroup of 5. Panzer-Division, wrote: 'Early on 28 January, the Russians reached the trenches at the northern end of the village, which Gauleiter Koch had had dug by women and school children for defence. Since the beginning of the fighting in East Prussia, these damned trenches had hindered us more than helped us. As a Panzer division – weak in infantry – we couldn't use the trenches ourselves. But once the Russians were in them, it was hard for us to drive them out' (Buttar 2010, p.148).

For 24. Panzer-Division, sent to East Prussia in early January 1945 to rest and reconstitute, the situation was no better: 'the division received orders to occupy and defend the western positions of the "Triangle of Heilsberg". The fact that it was impossible to procure maps of these defensive installations or even keys for the bunkers was typical of the confusion which characterized this phase of combat. Apart from this, the installations, which had been built in the twenties, were unsuited for the use of our weapons. The firing lanes had not been cleared for years and were thus unsuited for the use of modern anti-tank weapons. Hence, it was impossible to execute this order which had been issued in absolute ignorance of the actual situation' (*1986 Art of War Symposium*, p.419).

Oder-Warthe-Bogen

Though symbolically important, East Prussia was a sideshow when compared with Stalin's main prize: the German capital, Berlin. On 12 January the Soviets launched the largest single offensive of World War II. The most powerful thrusts were launched in the centre by Georgy Zhukov's 1st Belorussian Front whose ultimate objective was to capture the capital itself. Facing the might of the Red Army were a series of incomplete defensive lines that had been thrown up across Poland (a to d *Stellungen*) and where the positions had been finished there were insufficient troops to man them. Army Group A had only six battalions of fortress infantry to man the a1 Stellung, while the commander of Wehrkreis (Military District) XXI (Posen) had just 21 battalions of Volkssturm to hold his sector of the b1 Stellung. Ian Kershaw, in his book *The End*, describes how 'The speed and savagery of the assault swept away German defences' (Kershaw 2011, p.174) and just five days after the start of the offensive Warsaw was captured without a fight, much to Hitler's dismay. This was the first success in an ambitious plan which envisaged Soviet forces reaching the Oder in 15 days and ending the war in 45.

On 28 January the First Guards Tank Army, in the vanguard of Zhukov's thrust, reached the Tirschtiegel Barrier, a line of prepared positions in front of the main Oder-Warthe-Bogen defences. General Badadzhanyan's 11th Guards Tank Corps crossed the River Obra and on 29 January approached the first defences. Colonel I. I. Gusakovskii, commander of 44th Guards Tank Brigade, ordered a patrol to reconnoitre the German positions. The report that came back was promising: 'Comrade Colonel … Our troops have discovered that the main road [to Hochwalde] is obstructed by a barricade. It's made of rails.' Gusakovskii was immediately excited and asked if it could be dismantled. The answer came back in the affirmative and he directed the sappers to 'clear the road as quickly as you can' (Duffy 1991, p.110). This they did and on further investigation found that the road was not mined and nor was the enemy there in strength. Gusakovskii pressed home his advantage. Lead units were ordered to advance and by the morning of 30 January his tanks were deep inside the fortified region.

Two concrete pillboxes located near Panzerwerk 717 to cover the road between Kalau (Kalawa) and Hochwalde (Wysoka). These were simple structures with four loopholes and accessed through a steel door at the rear. Although having some military use they were also designed to confuse the enemy into thinking that a further Panzerwerk was located there.

However, all was not lost for the Germans. Troops of the 433rd and 463rd Reserve Infantry divisions of Wehrkreis (Military District) III, along with Volkssturm battalions, were rushed to the front. If Gusakovskii's force could be eliminated and the defences could be fully manned by a well-armed and motivated force, there was hope. Sadly, in January 1945 this was not feasible. The permanent defences were manned, but by troops who were not familiar with the defences, lacked leadership, and were often without uniforms and weapons.



Part of the road block near Panzerwerk 778 (Pz.W. 515) at Burschen (Boryszyn). It was constructed using rail lines set in concrete. A section has now been absorbed into a tree.

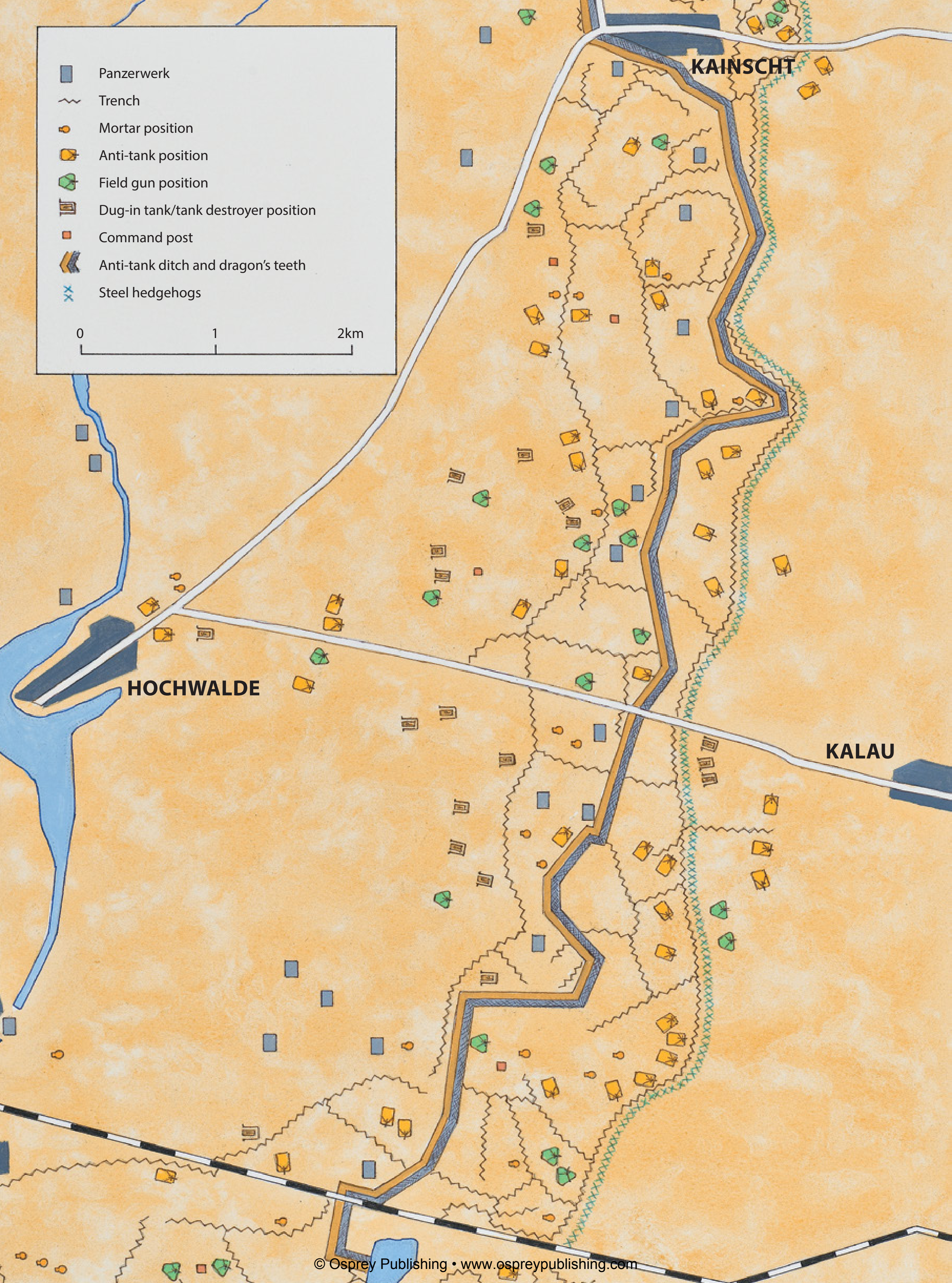
On 24 January a Volkssturm battalion from Küstrin was brought by railway to Trebitsch to man a section of the Oder-Warthe-Bogen. A member of the unit noted: 'While I was in Trebitsch, I honestly tried to get weapons. It was no use. When, in the early morning of 30 January, I received a report that the Soviets were crossing the Obra, I went to the combat position, where, in the "Ludendorff" bunker, I tried once again to get weapons or orders. The Gefreiter manning the telephone told me that the last officer had left and was not coming back. So then – still with only two rifles for the whole battalion – I gave orders to withdraw in the direction of Küstrin' (Kissel 2010, p.89).

Another Volkssturm battalion, this time from the Sternberg district, was mobilised on 21 January and was ordered to occupy the Burschen–Starpel sector of the Oder-Warthe-Bogen: 'The men of the battalion were still almost all in civilian clothing. Three machine guns, 17 rifles and 12 *Panzerfäuste* formed the total armament for one company of the battalion' (Kissel 2010, p.89). On the same day yet another Volkssturm battalion, this time from Landsberg/Warthe, was ordered to mobilise and man the defences: 'The men of the battalion were mostly wearing civilian clothing. In the position, training was carried out with Italian rifles, light machine guns, on built in heavy mortars and Czech anti-tank guns' (Kissel 2010, p.89).

Unused to combat, the Volkssturm units were to man the concrete bunkers while units from the regular army were to occupy the areas between. But the regular troops who were to provide backbone to the militiamen were not fresh troops, rather they were the shattered remnants of the German Ninth Army. In the face of the Soviet onslaught they had fallen back in disarray, seemingly unaware of the defences to their rear. They took up their positions but it was clear that discipline was breaking down and in the night before the Soviet attack the regulars melted away, which understandably discomfited the Volkssturm troops in their concrete bunkers. Some left their positions, but others fought on, including Friedrich Helmigk, a member of a Volkssturm

A fully restored officer's room in Panzerwerk 717. The room is fitted with a bed, a desk and a sink. On the right a small hatchway can be seen, which was used to pass messages from the *Nachrichtenraum* (signals office) next door.




Panzerwerk
Trench
Mortar position
Anti-tank position
Field gun position
Dug-in tank/tank destroyer position
Command post
Anti-tank ditch and dragon's teeth
Steel hedgehogs
0
1
2km
KAINSCHT
HOCHWALDE
KALAU

company which was manning positions in the central section of the OWB. His experiences are detailed in the colour artwork commentary on Page 53.

Chuikov later conceded that the defenders 'fought with determination but were lacking in skill. Of course, if the German divisional command had had just two days to study the situation and organise the fire system and cooperation with other German forces, it is difficult to say how the events would have developed. I am inclined to think that in that case we would have had to fight a long battle and sustain heavy losses' (Duffy 1991, p.380).



Panzerwerk 766 which formed part of Werkgruppe Jahn near Boryszyn, showing the machine-gun loophole covering the entrance and two of the ventilation holes. The covers have been removed. The other entrance is to the right.

Pommern Stellung

On the right wing of Zhukov's 1st Belorussian Front, Fifth Shock Army and Second Guards Tank Army advanced against the Pommern Stellung. This again had been constructed before the war and had been renovated in the autumn of 1944. Initially the armoured assault at the end of January and in early February was beaten back, but by 7 February the Red Army had broken through (although two Dutch divisions of the Waffen-SS continued to resist until the beginning of the Battle of Berlin when the First Polish Army succeeded in silencing them).

The failure of this prepared position to resist the Soviet onslaught came as something of a shock to many in Germany, but its speedy demise should not have been a surprise. The permanent defences had been stripped of weapons and were not designed to counter Soviet forces equipped with heavily armed tanks, supported by massed infantry and artillery. The field works constructed in the autumn also needed to be renovated, but there were no men to do this work and only a few soldiers to man the positions. Those regular troops that had fallen back towards the Pommern Stellung were deployed in front of the line and were quickly overrun, while others had been senselessly left to defend Festung Schneidemühl. Troops of the Volkssturm were mobilised, but many were unarmed and those that did possess a weapon had little ammunition. The district administrator of Deutsch Krone wrote: 'For many people, the fact that the Pommern-Stellung was so swiftly and completely overrun was incomprehensible. It had been disarmed after the war in Poland. But the positions could not be manned because there was a lack of personnel and

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AERIAL VIEW OF ODER-WARTHE-BOGEN DEFENCES IN 1945

In January 1945 the Soviets launched their Winter Offensive which had as its target Berlin, the capital of the Third Reich. In the path of the Red Army was the Tirschtiegel Riegel, a newly constructed screening position that ran from the River Warthe in the north to the Oder in the south. Behind this was the Oder-Warthe-Bogen defensive position. This had been constructed in the 1930s and in the intervening years much of the equipment and weaponry had been removed and used in the Atlantic Wall. However, the fabric remained and was now renovated to meet the new threat. In addition to the work on the old permanent fortifications, new defences were constructed. These were mostly fieldworks – trenches and anti-tank ditches – as well as concrete Tobruk shelters and Koch bunkers. One of the major failings of the original defences was their lack of anti-tank defences. To make up for this shortfall, tanks and self-propelled guns were dug in and positions were prepared for anti-tank guns.



Three quarter view of 'Heinrichstand' 38. The shelter was constructed before the war as part of the Pommern Stellung to protect Schneidemühl (Piła). The machine-gun loophole is visible on the right. The entrance was to the rear.

weapons. As far as personnel were concerned there was only the Volkssturm, who were almost entirely unarmed. There were no weapons' (Kissel 2010, p.102).

Having smashed through the Pommern Stellung, the right wing of Zhukov's 1st Belorussian Front now wheeled towards the coast. By the beginning of March they had reached Kolberg (Kołobrzeg) on the Baltic, and a fortnight later the city was taken.

Fortress cities

Like many other cities in the east, Kolberg was given the status of 'fortress' although the city's defences had not been completed. Perhaps the most famous of these fortresses or *Festungen* was Königsberg, the capital of East Prussia. At the beginning of the Soviet Winter Offensive Chernyakovsky's 3rd Belorussian Front had advanced deep into East Prussia and by 30 January Königsberg had been surrounded. 'Had the Soviets appreciated the weakness of the garrison and not made the mistaken assumption that the Germans had undertaken sufficient defensive preparations, they could have stormed the city then and there' (Noble 2010, p.209). But they did not. The opportunity was missed and instead Chernyakovsky prepared for a set-piece attack. In the interval the remnants of the Third Panzer Army prepared the old fortifications to meet the inevitable onslaught. Although constructed in the previous century the defences proved remarkably resilient and it was not until 9 April that the garrison eventually surrendered. However, the price of such resistance was high; the city had been razed to the ground and the defenders had suffered some 50,000 casualties and a further 80,000 captured.

Other cities in the path of the Soviet juggernaut could expect the same treatment. By 20 January lead elements of 1st Belorussian Front had reached Posen (Poznań) and three days later the city was surrounded. Chuikov's Eighth Guards Army was given the job of reducing the fortress. Chuikov was incensed that he had been given this unglamorous task rather than advancing towards the Oder. He later noted that Soviet intelligence had failed to identify the fact that 'there's a first-class fortress at Poznań. One of the strongest in Europe. We thought it was just a town which we could take off the march, and now we're really in for it' (Beevor 2002, p.66). His sarcasm was directed at Zhukov, but his comment was not without foundation. Posen was defended by a mishmash of regular units, officer cadets, Volkssturm and police – some 25,000 men in total. Completely lacking artillery or anti-aircraft weapons and with few tanks, the defenders held out for five weeks until 23 February 1945, when the fortress was finally overrun.

While Chuikov fought to capture Posen, the rest of 1st Belorussian Front advanced towards Berlin and by the end of January they had reached the eastern edge of Küstrin – a strategically important city which sat on the Oder and which Hitler had designated a fortress. Armoured units pushed into the city on 31 January in the hope of taking the defenders by surprise. The attack was repulsed by Volkssturm units and it was now clear that the city would only be taken by a set-piece attack.

Over the centuries the defences of Küstrin had been expanded and strengthened, but by 1945 they were a shadow of what they had once been; many of the defences had been dismantled or allowed to fall into a state of disrepair. Some of these weaknesses were ameliorated by the hasty construction of new defences, including the installation of three Panther turrets. (There should have been 12, but one was damaged en route and a further 8 were captured by the Soviets who had advanced to the city far more quickly than anticipated.) The defences, old and new, were manned by some 10,000 men with limited numbers of tanks, artillery pieces and anti-aircraft guns. These were concentrated to cover the routes into Küstrin which would be vital in the forthcoming battle, because flooding of land to the east of the city meant mass movements of armour was impossible. Eventually, after weeks of fierce fighting, much of it hand to hand, the Soviets prevailed. Chuikov, fresh from his success at Posen, described the final assault: 'From my observation post I could see heavy shells fired point-blank slamming into the enemy pillboxes and dugouts on the dykes. It was an impressive sight. Explosions hurled heavy stones and logs high into the air' (Le Tissier 2008, p.98). On 31 March a communiqué announced: 'The gallant defenders of Küstrin have succumbed to superior enemy forces' (Kissel 2010, p.90).



A rare photograph of a Panther turret used as an improvised fortification on the Eastern Front. The turret is from an Ausf. A and just distinguishable on the side is the turret number suggesting it was taken from a disabled tank. (Soviet National Archives)

Further to the south Frankfurt an der Oder was similarly given fortress status, but unlike Küstrin there had been sufficient time to complete the defences, in part because the Soviets concluded there was little point storming the city – it would surrender once Berlin was captured. All but one of the twelve Panther tank turrets supplied to the city were installed along with at least two Czech Panzer 38(t) turrets and some old tank guns on simple platforms (see colour illustration E on page 40). The commander of the besieged city 'had cobbled together a garrison from hospital inmates, troops who had lost their units, Volkssturm and Ersatz troops, and this garrison, inspired, by his own spirit, defended its bridgehead successfully against all attacks, and also held in check the Soviet bridgehead immediately to the south of Frankfurt' (Kissel 2010, p.90). The men of Panzerturm Kompanie 1312 manning a Panzer 38t turret were a classic example. The 37mm gun was hopelessly inadequate by this stage of the war, but still they shelled the enemy from their position on the Kliestower Road. The enemy responded but was unable to silence the turret. Eventually on 22 April the garrison was given permission to abandon the city.



A 38(t) Panzer turret that was mounted on a wooden shelter and installed on Kliestower Road in Frankfurt an der Oder. This example was saved and is now on display in Festung Königstein, near Dresden.



Ten days later Berlin fell and on 8 May the war ended. The many fortifications constructed by the Germans had not been able to stop the Soviet advance, but Guderian was effusive in his later musings, noting that they played 'no small role in influencing the course of events, providing the troops with support and slowing down the Russian offensive to such a great extent that the demarcation line between the Western Powers and the Soviet Union became the Elbe and not some other line still further back' (Duffy 1991, p.373).



View into one of the chambers off the main tunnel system of the Oder-Warthe-Bogen. This evidently held some of the treasures deposited in the tunnels by the Nazis during the war. There is still some debate about the whereabouts of some of the treasures deposited there.

AFTERMATH

The rapid advance of the Red Army in January 1945 meant that many of the defences of the Oder-Warthe-Bogen were captured intact. However, with the German forces in disarray, the Soviets did not pause to inspect the defences, but instead pressed home their advantage and advanced to the Oder, crossing the last major obstacle before the German capital, Berlin, which fell in May 1945. Soon after the Germans surrendered and only then did the Soviets begin to investigate the bunkers and the labyrinth of tunnels on the old German border. Although the Germans had removed some equipment in the war, much still remained and, as in the rest of Soviet occupied territory, anything of value was appropriated, including weapons, ventilation machinery, pumps and electrical equipment. It was then shipped to the Motherland as a form of reparations for losses suffered by the Soviet Union in the war.



SOVIET ATTACK ON THE CENTRAL SECTION OF THE ODER-WARTHE-BOGEN

By the end of January 1945 the Red Army stood in front of the Oder-Warthe-Bogen defences. The majority of these defences had been constructed in the 1930s and still looked impressive. However, there were few troops to man the defences and these tended to be Volkssturm units who had no experience of fighting in such prepared positions, nor indeed much experience of fighting at all. One such was Friedrich Helmigk, a member of a Volkssturm company which was manning positions in the central section of the OWB. He later wrote about his experience.

'Towards 9 o'clock we sight the first Soviet tanks, 13 fairly heavy tanks rolling up from Calau [Kalawa] to our anti-tank barriers … Now the first tank comes out of the sunken road, then the second, and third. They stop in front of the barrier … The leading tank opens its hatch and some Soviets clamber out. A fat officer with a walking stick goes with two men to the barrier and inspects the obstacles. The fellows behave as if it was deepest peacetime. A couple of words with the Feldwebel, then I get the officer in my sights, pull the trigger and fire. The man folds up like a penknife … When they hear my shot the Soviets shoot apart. Our machine gun is now hammering away. Our mortar peppers a series of 10 to 12 rounds on to the tanks. We both slide quickly as we can into our foxhole. Scarcely are we back in there again and the armoured turrets are bolted shut than we get five to six 15cm shells planted against our doors. Our machine gun falls silent. The gun is completely shot up, one man's slightly wounded … Soon we see infantry approaching; not very many of them, but still at least a good 100 men. They are firing from all the bushes and from the small area of woodland which lies in front of us in the direction of Calau. At last our own machine gun has been changed and we're able to fire with it. To and from our little mortar shoots out a series of rounds. The Soviets then disappear immediately from the place where they fall. In return, we get a few shells on the turret, so that the whole bunker shakes, but the Soviets can do us no serious damage … And so the hours pass … At 3 o'clock in the afternoon, the tanks suddenly start moving and roll back the way that they came. We're beside ourselves with joy that the Soviets are retreating' (Kissel 2010, p.195) .The men of the bunker were engaged in a number of further skirmishes with the enemy, but held on for a month, before breaking out of the position and making their way to the German lines.



The miles of tunnels were also investigated by the unit responsible for recovering works of art looted by the Germans. This resulted in the discovery of a hidden chamber that contained paintings, ceramics and coins. These items were taken to Moscow and later, in 1956, the items that had been taken from Poland were returned from whence they had come.

In this period the Soviets also took the opportunity to film and photograph the defences, principally for propaganda purposes. These were, after all, the massively strong border defences that the newspaper *Ostdeutscher Beobachter* proclaimed to be 'a giant network of fortifications which is completely ready' (Noble 2010, p.288). In fact, although impressive they were unfinished and proved largely ineffectual. A popular choice was Werkgruppe Scharnhorst and in particular Panzerwerk 717 – one of the best preserved of the defences.

The Sechsschartenturm (20P7) of Panzerwerk 717 showing extensive damage. There is some debate about the cause. One school of thought is that it was the result of Soviet firing practice after the war, whilst another believes that it occurred during the war and was designed to 'encourage' the stubborn defenders to surrender.

Sadly, some sources suggest that it was at this time that the Sechsschartenturm was used for target practice by the Soviets to understand how effective Soviet munitions were against such defences, though others suggest that in fact the damage was sustained in the final battles of the war to 'encourage' the defenders to surrender. Certainly Panzerwerk 712 was used to test 152mm and 203mm shells. The reinforced concrete proved remarkably resilient.

With everything of any value removed, with the tests completed and having exhausted the propaganda opportunities some of the defences of the Oder-Warthe-Bogen were destroyed – in particular, those defences that were considered to have some value in a future war. Their work done, the Soviet Army abandoned the defences and they were given over to the Polish authorities. Companies were now licensed to remove anything else of value that remained and they were 'helped' in this by unofficial contractors and locals. Anything that was not screwed down (and in many cases things that were) was removed including the narrow gauge trains and carriages, pipework and cabling.



An example of a diesel engine similar to those that would have been used in the tunnels of the Oder-Warthe-Bogen. This example was moved into the tunnels after the war, sometimes having to be physically manhandled where tracks were not in place.

The official and unofficial dismantling of the Oder-Warthe-Bogen defences ended in 1953 when the Polish Army was given control. The defences were reviewed and an inventory completed. Work was then started to partially restore the facility, bunkers were cleared and the tunnels were painted. The original numbers were removed and replaced with a four-figure designation, so, for example, Panzerwerk 717 became Ob. (Objekt) 2572. In certain parts of

the defensive line little or no work was done because of flooding, or because the original building work was incomplete. In such cases it is often still possible to see original German markings on the wall.



One of the bats resident in the Oder-Warthe-Bogen tunnel system. There are very few in the tunnels in the summer when this photograph was taken. Between October and April the full tunnel system cannot be visited because the bats cannot be disturbed.

The refurbishment of the defences of the Oder-Warthe-Bogen was completed with a view to reusing the facility in a future war against the West, but the difficulties of reorienting defences that were originally designed to confront an enemy coming from the east were enormous and instead plans were considered to adapt the facility to store nuclear weapons. However, this idea was abandoned, as were the defences in 1957. Plans to resettle local inhabitants were dropped and instead contractors were once again employed to dismantle the defences. Armoured cupolas and armoured plates were blasted and cut up using blow torches. At this time the facility was still open to the public and further damage was done by vandals and individuals and groups looking for more lost treasure from the war.

Following the abandonment of the old border defences, nature began to reclaim the area. In the 1970s it was discovered that bats were using the tunnels and bunkers, particularly to hibernate in the winter. An assessment was undertaken and it was found that there were at least 20,000 bats in residence, some of them rare or endangered and in 1980 part of the defences of the Oder-Warthe-Bogen was classified as a nature reserve; the Nietoperek Bat Nature Reserve.

The new residents soon proved a valuable ally as the facility was threatened once again. Plans were revealed to turn the abandoned defences into a nuclear waste dump. Concerned locals, fortification groups and naturalists campaigned against the idea and eventually they won their battle against the developers. In 1988 the government dropped the plans, citing the importance of the area to natural history and tourism.



The remains of the Dreischartenturm 3P7 – three-loophole armoured turret - of Panzerwerk 778 (Pz.W. 515) at Burschen (Boryszyn). This would have been armed with an MG08. At the rear are the remains of the ventilation system and in the bottom corner is the main access to the cupola.

THE SITES TODAY

After World War II Germany's eastern borders were redrawn and all of the eastern defences disappeared behind the Iron Curtain. Their status, certainly to a Western audience, was largely unknown. However, interest in them began to stir after the military had departed in the 1950s. Fortification enthusiasts and local people, fascinated with the relics on their doorstep, began to explore the area. In the late 1960s and the first half of the 1970s interest in the defences grew as Red Army veterans visited the sites of their exploits, including the defences of the Oder-Warthe-Bogen. This period also saw the construction of a series of monuments commemorating the various actions. In the main square in Liebenau (Lubrza) there is a monument to the success of the 11th Guards Armoured Corps which was the first unit to break through the OWB defences in January 1945. The 1970s also saw the first organised tours of the eastern defences. Walking tours, that included passage through some of the tunnels of the Oder-Warthe-Bogen, were conducted by the Polish Tourist and Sightseeing Society (PTTK) and the Gorzów Speleoklub 'Gawra' (Gorzów Caving Club).

In the second half of the 1980s, as a result of the great publicity generated by the campaign against dumping nuclear waste, and the resulting protests, interest in the tunnels of the OWB increased and tourism grew. Trying to meet the demands of these visitors, the PTTK in Miedzyrzecz trained a group of tourist guides, who established and ran a special underground tour in the driest and safest part of the tunnels. The route included *Panzerwerke* 717, 716 and 716a and the Bahnhof (Station) 'Heinrich'.

Still the interest in the defences was primarily confined to the Eastern Bloc. Mikhail Gorbachev's policy of *glasnost* or 'openness' changed all this. The main goal of the policy was to make the country's management transparent and open to question, but it had a number of unintended consequences. During the 1980s, there were calls for greater independence from Moscow's rule, especially from countries along the Soviet Union's western border. In 1989 the Berlin Wall fell and set in train a series of events that saw many of the nations in the former Eastern Bloc claim independence. The greater freedom enjoyed by these states also led to increased contact between East and West. Restrictions on travel were loosened, allowing increased business and cultural contact.

These changes combined meant that access to the German fortifications in the east was much improved, certainly those in modern-day Poland where many of the defences were located. Situated close to the German border, the defences of the Oder-Warthe-Bogen, could easily be visited by the casual tourist. Ironically, in 1991, as people in the West were given the chance to gain better access to the defences, the tunnels were sealed. In the years after the defences were abandoned the fabric of the buildings

The devastated remains of Panzerwerk 780 (Pz.W. 514) at Starpel (Staropole). This bunker formed part of the Oder-Warthe-Bogen and was fitted with a Dreischartenturm (3P7) and a fighting position with armoured plate (10P7) which protected the MG08.



had been attacked by thieves, treasure hunters and vandals who defaced the walls. Limiting access was also designed to prevent accidents; a number of people have lost their lives in the tunnels.

Since that time the only way to legally and safely visit the tunnels of the Oder-Warthe-Bogen has been to join one of the official guided tours. There are two principal operators (MRU/'Ostwall'), which now work alongside each other to the benefit of the visitor.

When driving from Germany follow the E30 (A2) from Frankfurt (Oder) leaving the main road at the Jordanowa turn-off (a toll is payable here). The signage is initially poor on the highway, but follow the new S3 towards Gorzów Wielkopolski coming off at Miedzyrzecz and then take the E65 towards Kaława. From here the defences are well signposted.

At Pniewo – between Kaława and Wysoka – you will see Panzerwerk 717 and this is the start of one of the tours. There is parking, a shop and ticket desk as well as military vehicles on display. The dragon's teeth, Panzerwerk 716 and 717 and Tobruk machine-gun position are free to visit. To go inside you have to pay.

Contact details: Muzeum Fortyfikacji I Nietoperzy, Pniewo 1, 66-300 Miedzyrzecz, Poland. Tel. (0048) 95 741 99 99 or (0048) 509 868 965. E-mail: biuro@bunkry.pl Website: www.bunkry.pl

The second tour operator, Pętla Boryszyńska, is based near Boryszyn – again it is well signposted. The tour starts at Panzerwerk Nord. Tours are available in three languages (English, German and Polish), but if you want a tour in English it is advisable to make a reservation. The facility is open every day between 15 April and 15 October (10.00 until 17.00). For the more intrepid visitor you can take a bicycle tour of the tunnels, but most will choose to walk. There are standard tours (1–2 hours) and extreme tours (4–6 hours). Irrespective you should wear sensible footwear and dress for the cool conditions (8–10 degrees). The lighting in the tunnels is limited, so torches are provided. For the longer tours – which could see you walk 10km – it is advisable to bring food and water. There is a shop at the entrance, but in general the amenities here are less well developed.

Contact details: Trasa Turystyczna Pętla Boryszyńska, Boryszyn, 66-300 Międzyrzecz, Poland. Tel. (0048) 888 879 969 or (0048) 601 700 274. E-mail: katarzyna.holownia@op.pl or bunkry@adventurequad.pl Website: http://bunkry.lubrza.pl/en

It is worth noting at this point that there are numerous other German defences further east. However, the defences in East Prussia, though quite extensive, are less accessible, situated in north-eastern Poland and some (around Königsberg) are in the Kaliningrad Oblast which is part of Russia. Elsewhere in the former Soviet Union the defences (like the Panther Line) were not as concentrated, nor permanent, and as such there is less to see. For these reasons, the travel advice that follows relates primarily to Poland.



One of the chambers off the main tunnel system of the Oder-Warthe-Bogen. The recesses that can be seen in the concrete wall are most likely for the supports for a second floor. The marks on the floor are droppings from the 35,000 bats that inhabit the tunnels.

Travel advice

Driving

Poland is a member of the European Union and has open borders with other member nations, which means it is easy to drive to the eastern defences, especially those located near the German border. The main roads are excellent and many of them are modern, having been constructed with EU money. However, be prepared for diversions due to numerous roadworks. Away from the main arterial routes there are few dual carriageways and even main roads between major towns and cities can be narrow and poorly surfaced. A system of toll collection is in place on selected sections of motorways, expressways and national roads. Roads around the Oder-Warthe-Bogen defences and in other parts of rural Poland are less well kept and some smaller roads are cobbled – something to remember when in your own car or a rented vehicle.

Driving licences issued by any EU member state are mutually recognised in other EU member states, but you should carry original vehicle-registration documents and insurance papers at all times. You will need to present these documents if you are stopped by the police. If you do not have these papers the police may impound your vehicle.

Flying

Direct flights from the UK and US serve Berlin, Warsaw and Kraków airports which are good jumping-off points for visiting the various defences and increasingly there are also flights to regional airports which are often located nearer to the defences (e.g. Poznań).

By train

For the slightly more intrepid traveller it is also possible to take the train. Train services run between all major European cities (including London) and Polish cities. Stations in the major population centres are modern with good signage. The same cannot be said of stations in the provinces. Buying tickets is straightforward but there are numerous train operators and tickets are not transferable.



One of the massive bolts that was used to secure the Sechsschartenturm – six-loophole armoured turret. Also visible are the exposed steel reinforcing rods used to strengthen the concrete. The turret was originally part of Panzerwerk 775 (Pz.W. 516) at Hochwalde (Wysoka) which formed part of the Oder-Warthe-Bogen.

Accommodation

Infrastructure during the Communist era suffered from a lack of investment and only now is this being addressed with new hotels being built and older stock being modernised. However, there is still a lack of good quality affordable accommodation. This is not the case in the former East Germany.

Entry requirements

If you are a British or US citizen visiting Poland, you do not need a visa. For stays of up to three months your passport should be valid for the proposed duration of your stay.

Currency

Though a member of the European Union, Poland has not yet adopted the Euro and still uses the zloty (made up of 100 groszy). ATMs taking all major cards can be found in larger cities and towns though there will invariably be a charge for using them. Credit and debit cards are widely accepted, but less so in the provinces and as such it is advisable to carry a reasonable amount of cash. US Dollars, Sterling and Euros can be readily exchanged at banks, but visitors may find better rates at bureaux de change in city centres and at rail stations.

Language

Although English is spoken in Poland it is not as widely used as in much of Western Europe. Generally speaking the older generation will not speak English, while younger people and those in the tourist industry will. It is useful to learn a few key words and phrases.

Safety considerations

When considering visiting any defences it is important to take certain precautions. The defences in western Poland are generally easy to visit, but you should ask permission where defences are located on private property. Defences further east are often less accessible with some located in dense forest and it is therefore better to visit the sites in the spring or autumn when the undergrowth is less of a problem and whenever possible take a local guide.

When you are visiting the defences independently (i.e. not as part of an organised tour) there are many dangers. At least one bunker I visited (Pz.W.775) near Wysoka had an unguarded opening in the roof where the Sechsschartenturm had been removed. Inside the story was the same. A gloomy entrance disguised the fact that the floor over the entrance trap had been removed and could easily take its toll on the unwary. There is also the modern menace of rubbish which is not only unpleasant but also brings with it other health hazards. Even on organised tours there are dangers. There are few lights in the tunnels and there are unguarded drops and holes, so listen closely to the guide and exercise extreme caution.



One of the 19 massive concrete air raid shelters built at Zossen – the German Army Headquarters. It was built in a cigar shape because this was much less susceptible to damage from Allied air raids. Visible in the centre is the entrance, now bricked up, which was reached by steps.

Other sites of interest

The defences of the Oder-Warthe-Bogen lie on the western border of Poland and are therefore within easy reach of Berlin. As such it is possible to visit a number of the sites in and around the German capital that are associated with World War II. Of particular relevance is the museum at the Kummersdorf test site and the Zossen bunkers. They are geographically close together, south of Berlin, and conveniently the former has tours in the morning (on certain days) and the latter in the afternoon. Tours of the underground part of the Army Headquarters start at 14.00 – more frequently at the weekend and on bank holidays – and last around 90 minutes and are in German. More extensive tours can be arranged. Also of interest are the numerous bookshops in Wunsdorf.

To the east of the capital is the Seelow Heights Museum which details the last desperate attempts by the Germans to stop the Soviet advance before Berlin. You may also choose to visit Küstrin (Kostrzyn) which was a fortress and was the scene of heavy fighting in 1945. In the capital itself there are many war-related sites, but perhaps most pertinent are the tours of the underground tunnels of the capital, particularly the one that takes in the Flak tower. (www.berliner-unterwelten.de). However, disappointingly, photographs are not permitted.

In Poland, aside from the main defensive lines, it is possible to visit Poznań, which was the scene of desperate fighting in 1945. Many of the old forts still exist and show the scars of war. There are also newer bunkers constructed by the Germans that can be viewed. Further north it is feasible to visit remains of the Pommern Stellung, though these are not as well preserved and organised as the Oder-Warthe-Bogen. In particular, there are good examples around Deutsch Krone (Wałcz) and significant elements of the defences around Schneidemühl (Piła) still exist and can be visited and photographed.

For the more adventurous traveller visiting the fortifications located in the former East Prussia, it is possible (indeed recommended) to visit FHQ Wolfsschanze, or Wolf's Lair, at Rastenburg (Kętrzyn). This is where Hitler directed much of the fighting on the Eastern Front and where in July 1944 an attempt was made on his life. The buildings were demolished by German engineers, but it is still worth a visit, as are the massive bunkers of the Army Headquarters 'Mauerwald' which are nearby.

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GLOSSARY AND ABBREVIATIONS

Barracks — Living accommodation for soldiers and workers.
Beobachtungsglocken — Observation cloche.
Bunker — General term for any kind of strengthened fighting post. Originally referred to a shelter or a store.
BVG — Bochumer Verein für Bergbau und Gußstahlfabrikation.
Casemate — Originally a bombproof chamber built for cannon or to provide barrack accommodation. The German military tended to use the term in respect of their flanking installations.
Cloche — A non-movable armoured turret.
DAF — See *Deutsche Arbeitsfront*.
Deutsche Arbeitsfront (DAF) — German 'Labour Front'. Labour organisation set up to take the place of the labour union system.
Drehbrücke — Swing bridge.
Dreischartenturm — Half-cloche with three embrasures. Armoured turrets were built into the concrete side of the bunker.
Embrasure — An opening in a bunker through which a gun may be fired.
Feldkanone (FK) — Field gun.

Feste	German fort developed at the turn of the century.
Festung	Fortress.
Festungsflammenwerfer	Fortress flamethrower.
Fieldwork	A non-permanent fortification, generally constructed from earth and timber, although sometimes reinforced with concrete.
FK	See *Feldkanone*.
Flak	See *Flugzeugabwehrkanone*.
Flugzeugabwehrkanone (Flak)	Anti-aircraft gun.
Höckerhindernis	'Dragon's teeth': rows of linked concrete obstacles designed to stop tanks.
Kampfwagenkanone (KwK)	Tank gun.
Kipprollbrücke	Retracting bridge.
KwK	See *Kampfwagenkanone*.
Lüftungskuppeln	Small ventilation dome located on bunker roof.
Maschinengranatwerfer	Automatic grenade launcher.
Notausgang	Emergency exit.
Organisation Todt (OT)	Paramilitary organisation employed in the construction of major state and party building programmes.
OT	See *Organisation Todt*.
OWB	Oder-Warthe-Bogen – a.k.a. Miedzyrzecki Rejon Umocniony or Meseritz (Miedzyrzecz) Fortified Region.
PaK	See *Panzerabwehrkanone*.
Panzerabwehr	Anti-tank defence.
Panzerabwehrkanone (PaK)	Anti-tank gun.
Panzerkasematte	Armoured casemate.
Panzerwerk	In 1939, as a propaganda ploy, all fortifications were given the title Panzerwerk to emphasise the strength of the defences.
Pillbox	British term coined in World War I to describe concrete machine-gun shelters that resembled pillboxes.
Pionier	German term for engineers (pioneers).
Pz.W	See *Panzerwerk*.
RAD	See *Reichsarbeitsdienst*.
Regelbau	Standard design.
Reichsarbeitsdienst (RAD)	State Labour Service.
Sechsschartenturm	Six embrasure machine-gun cloche.
Stellung	Position or line.
Tobruk	Small concrete structure with ring-shaped opening at the top primarily designed to accommodate a machine gun.
Trägersperre	Obstacle that straddled a road/track which in time of war housed steel 'H' beams to block the enemy advance.
Werk	Self-contained fort.
Werkgruppe	Groups of *B Werke* constituting a new type of fort.

INDEX

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Osprey Publishing are supporting the Woodland Trust, the UK's leading woodland conservation charity, by funding the dedication of trees.

DEDICATION

This book is dedicated to C & K – much missed, never forgotten.

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AUTHOR'S NOTE

In books dealing with locations on the Eastern Front, place names often change, sometimes more than once. For example, Hochwalde, formerly in eastern Germany, is now in Poland and known as Wysoka. As a general rule, place names have been quoted in the original German and the contemporary name quoted in brackets. It is also worth noting that the defences of the Oder-Warthe-Bogen are also known as the Miedzyrzecki Rejon Umocniony or Meseritz (Miedzyrzecz) Fortified Region.

IMAGES

All photographic images that appear in this work are from the author's collection, unless otherwise indicated.